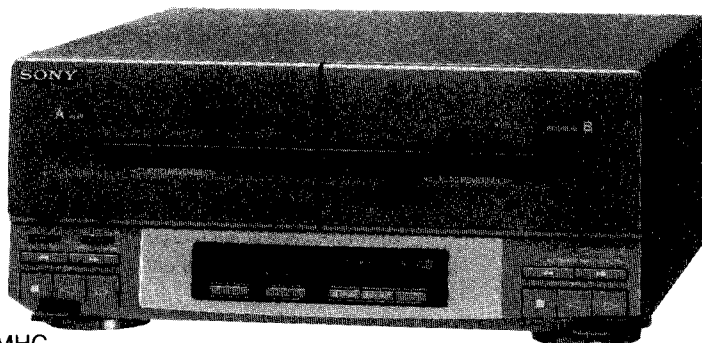


TC-EX90/EX100


SERVICE MANUAL

*AEP Model
UK Model
E Model*



TC-EX90 is the deck section in MHC-EX50/EX90, and TC-EX100 is the deck section in MHC-EX70AV/EX100AV.

Photo : TC-EX100 (SILVER)

Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism		TC-EX5
Tape Transport Mechanism Type	DECK-A	TCM-190RA12CL
	DECK-B	TCM-190RB52C

SPECIFICATIONS

Recording system
4-track 2-channel stereo

Frequency response
(DOLBY NR OFF)
40 - 13,000 Hz (± 3 dB),
using Sony TYPE I cassette
40 - 14,000 Hz (± 3 dB),
using Sony TYPE II cassette
40 - 15,000 Hz (± 3 dB),
using Sony TYPE IV cassette

Wow and flutter
0.1% WRMS $\pm 0.3\%$ (DIN)

Dimensions
Approx. 280 x 122.5 x 280 mm
(11 1/8 x 4 7/8 x 11 1/8 in) (w/h/d)
incl. projecting parts and controls

Mass
Approx. 2.8 kg
(6 lb 2 oz)

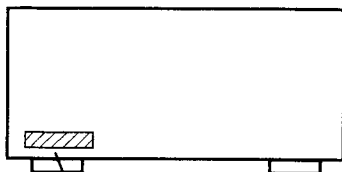


MC-Service

STEREO CASSETTE DECK
SONY®

MODEL IDENTIFICATION

— BACK PANEL —



TC-EX100 (AEP, UK Model)	: 4-978-260-0□
TC-EX100 (E Model)	: 4-978-260-1□
TC-EX100 (Saudi Arabia Model)	: 4-978-260-2□
TC-EX100 (Thailand Model)	: 4-978-260-3□
TC-EX90 (AEP, UK Model)	: 4-978-260-4□
TC-EX90 (E Model)	: 4-978-260-5□
TC-EX90 (Saudi Arabia Model)	: 4-978-260-6□
TC-EX90 (Thailand Model)	: 4-978-260-7□

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK Δ OR DOTTED LINE WITH MARK Δ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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SECTION 1

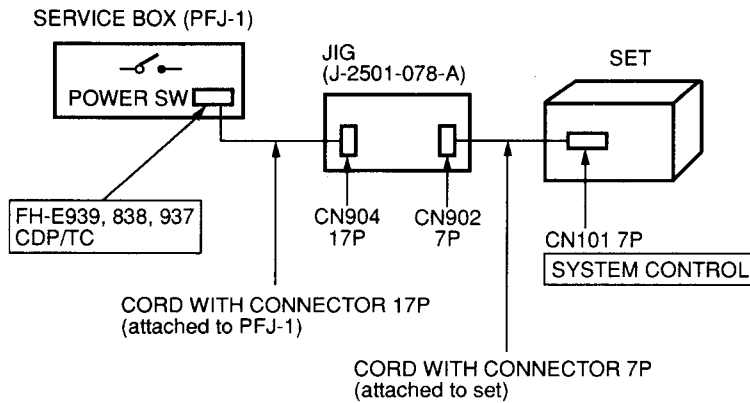
SERVICING NOTE

How to operate with a single unit.

Normally, this set is not operated with its own.

The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.

Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.



[Tune light on all LED]

Push ■ button of DECK A and ○ REC MUTE button at the same time. then, all segments of LED turn on the light.

To cancel the mode, push ■ button of DECK A and ○ REC MUTE button at the same time again.

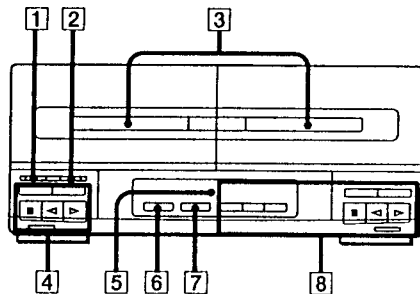
SECTION 2

GENERAL

This section is extracted
from instruction manual.

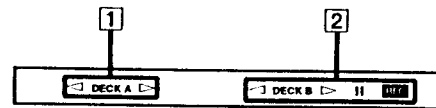
Index to Parts and Controls

Front Panel



- 1** DOLBY NR selector (15)
 - 2** DIRECTION MODE selector (14)
 - 3** Cassette compartments (14)
 - 4** Tape operating buttons (for deck A)
 - ▷ (front side play) (14)
 - ◁ (reverse side play) (14)
 - (stop) (14)
 - ▶▶ (fast rightward and AMS**) (14)
 - ◀◀ (fast leftward and AMS**) (14)
 - ⏏ (eject) (14)
 - 5** Display window
 - 6** CD SYNC button (15)
 - 7** DUBBING MODE button (19)
 - 8** Tape operating buttons (for deck B)
 - ▷ (front side play) (14)
 - ◁ (reverse side play) (14)
 - (stop) (14)
 - ▶▶ (fast rightward and AMS**) (14)
 - ◀◀ (fast leftward and AMS**) (14)
 - ⏏ PAUSE (14)
 - REC MUTE (16)
 - REC (recording) (16)
 - ⏏ (eject) (14)
- **AMS: Automatic Music Sensor (14)

Display Window



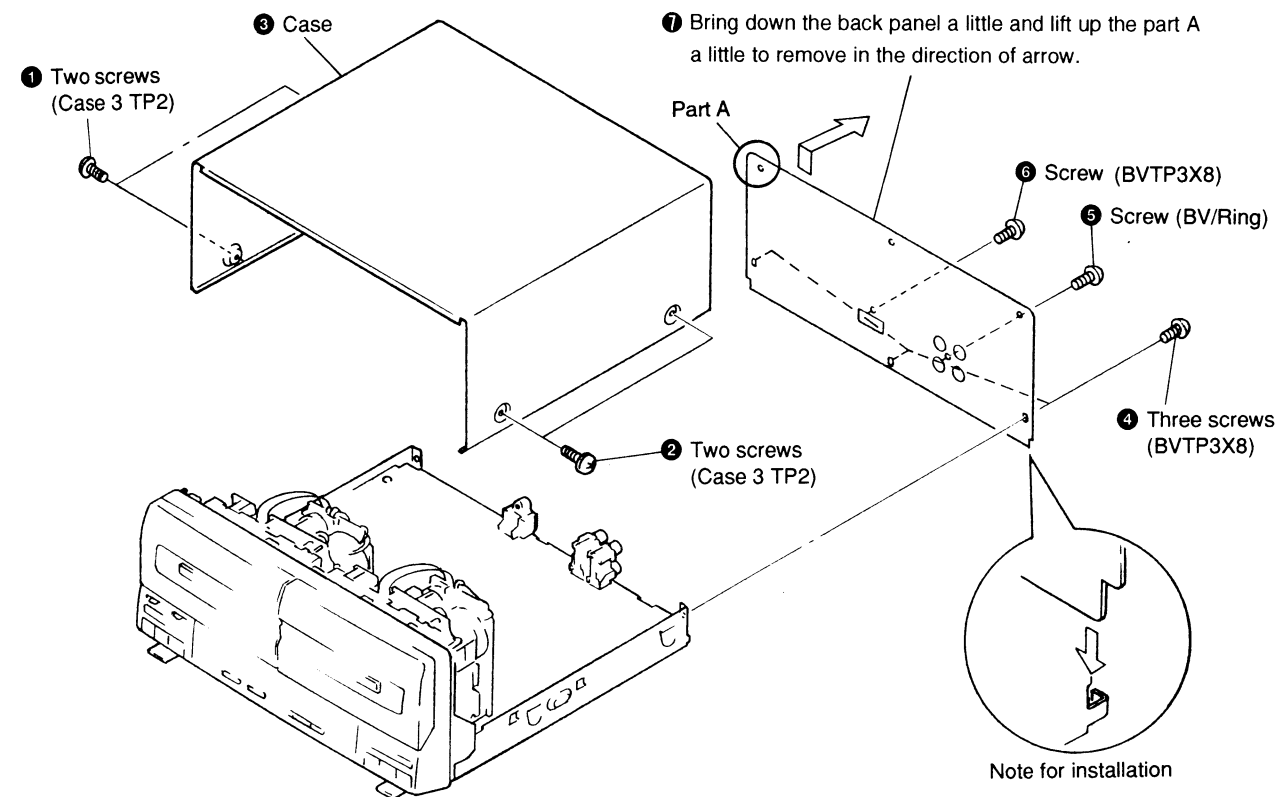
- 1** Deck A status indication
- 2** Deck B status indication

MC-Service

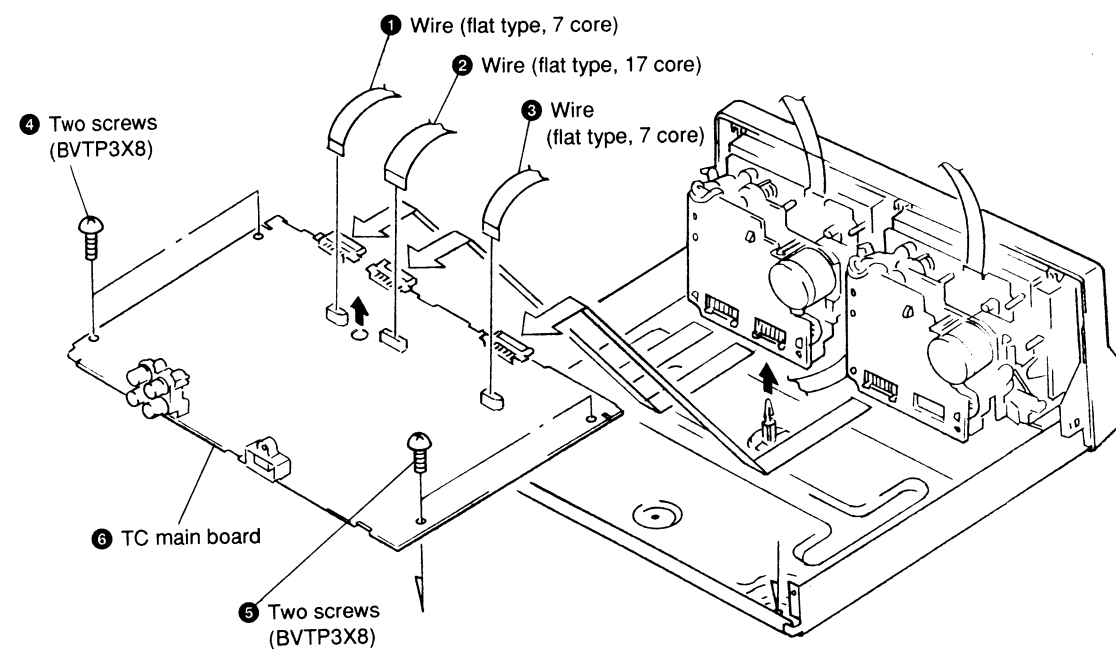
SECTION 3 DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

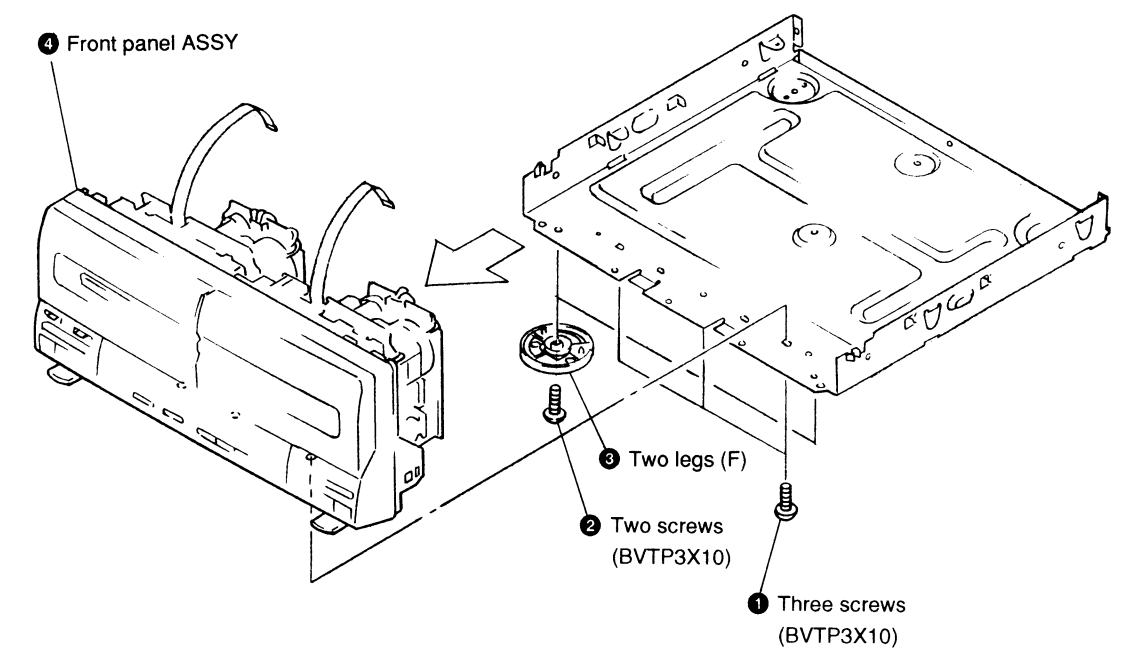
3-1. CASE AND BACK PANEL



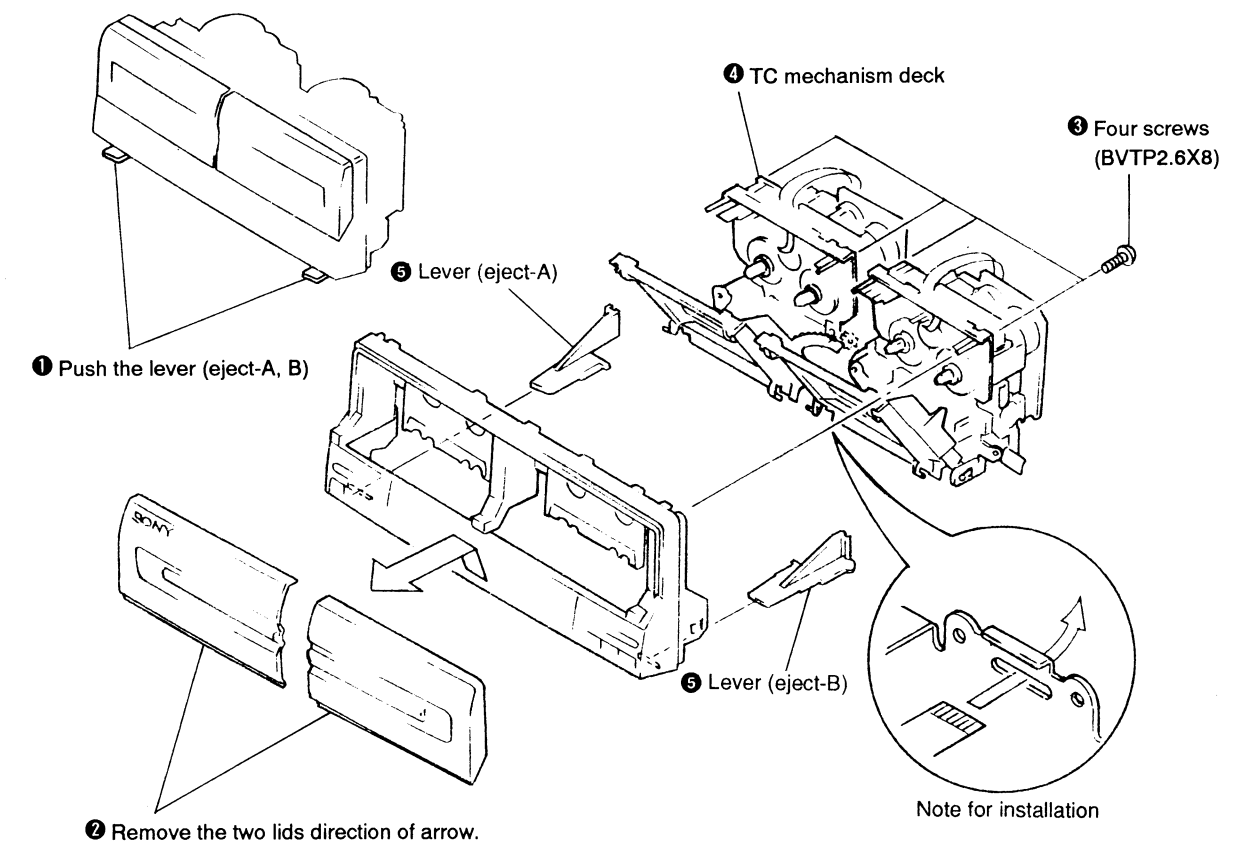
3-2. TC MAIN BOARD



3-3. FRONT PANEL ASSY



3-4. TC MECHANISM DECK



SECTION 4 ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENTS

PRECAUTION

- Clean the following parts with a denatured alcohol-moistened swab :
record/playback/erase head pinch roller
rubber belts capstan
- Demagnetize the record/playback head with a head demagnetizer.
- Do not use a magnetized screwdriver for the adjustment.
- After the adjustments, apply suitable locking compound to the parts adjusted.
- The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Torque	Torque meter	Meter reading
Forward	CQ-102C	30 to 60 g • cm (0.42 to 0.83 oz • inch)
Forward Back tension	CQ-102C	1 to 5 g • cm (0.014 to 0.069 oz • inch)
Reverse	CQ-102RC	30 to 60 g • cm (0.42 to 0.83 oz • inch)
Reverse Back tension	CQ-102RC	1 to 5 g • cm (0.014 to 0.069 oz • inch)
FF, REW	CQ-201B	65 to 90 g • cm (0.91 to 1.25 oz • inch)

Tape Tension Measurement

Torque meter	Meter reading
CQ-403A	more than 110 g (more than 3.88 oz.)

4-2. ELECTRICAL ADJUSTMENTS

PRECAUTION

- The adjustment should be performed in the publication.
(Be sure to make playback adjustment at first.)
- The adjustments and measurement should be performed for both L-CH and R-CH.
 - Switch position
DOLBY NR switch : OFF
DIRECTION MODE switch : \rightleftharpoons

Test Tape

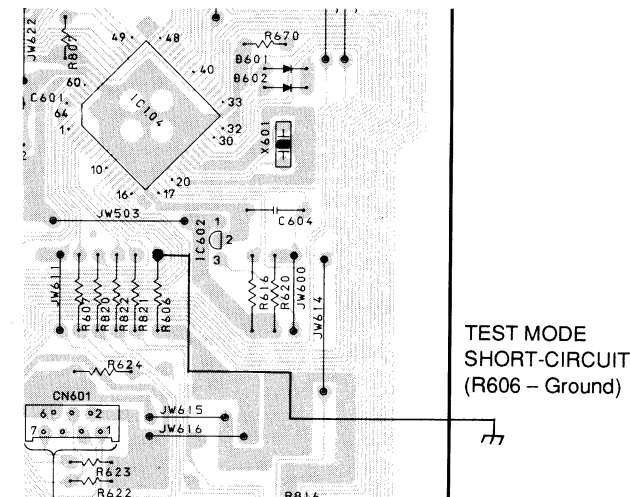
Tape	Contents	Use
P-4-A100	10 kHz, -10 dB	Azimuth Adjustment
P-4-L300	315 Hz, 0 dB	PB Level Adjustment
WS-48B	3 kHz, 0 dB	Tape Speed Adjustment

0dB = 0.775V

Test mode

- If the power supply is TA-EX50/EX70/EX90/EX100. (When AU BUS is alive)
 - Short-circuit following portion (R606 – Ground) on the TC MAIN board.
 - Turn the POWER on.
 - Open the short-circuit to release test mode.

[TC MAIN BOARD]



- If the power supply is a jig.
Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.

Record/Playback Head Azimuth Adjustment

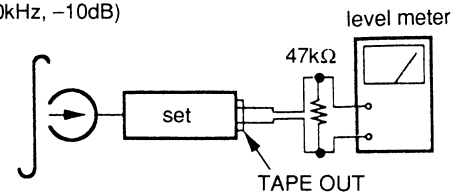
DECK-A DECK-B

Note : Perform this adjustment for both decks.

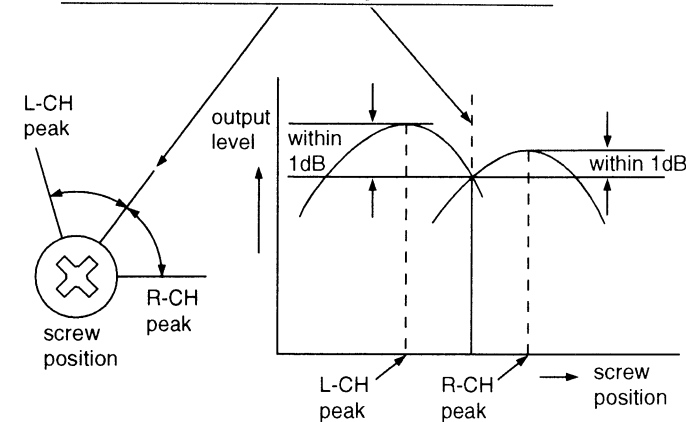
Procedure :

- Mode : Forward playback

test tape
P-4-A100
(10kHz, -10dB)

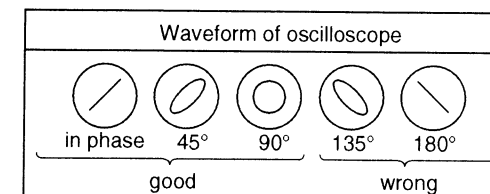
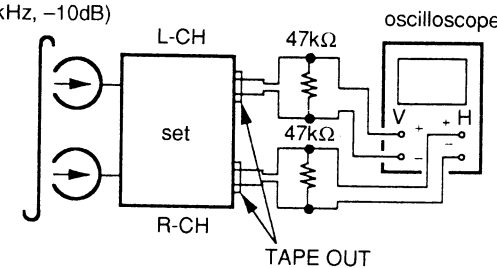


- Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1 dB.



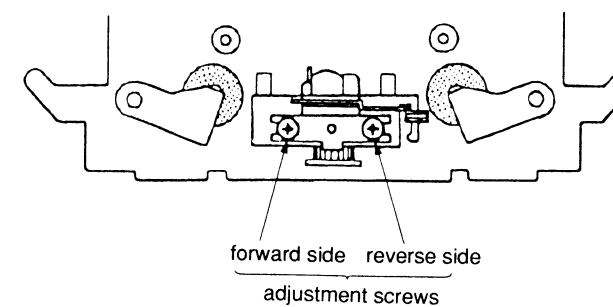
- Mode : Playback

test tape
P-4-A100
(10kHz, -10dB)



- Change the reverse playback mode and repeat the steps 1 to 3.
- After the adjustment, lock the adjustment screws with suitable locking compound.

Adjustment Location : — Record/Playback head —



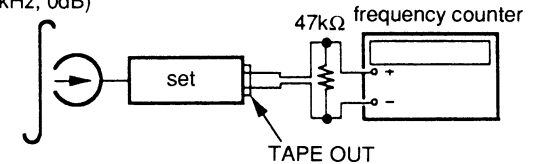
Note : To adjust Azimuth, after take off WINDOW ASSY, ILLUMINATOR and LID ASSY CASSETTE of FRONT PANEL.

Tape Speed Adjustment DECK-A DECK-B

Procedure :

Mode : Forward Playback

test tape
WS-48B
(3kHz, 0dB)



(high speed adjustment)

- Set to FWD playback mode.
- Press the DUBBING MODE button at HIGH position.
- Adjust RV72 so that the frequency counter reading becomes $6,000 \pm 60$ Hz.

(normal speed adjustment)

- Set to FWD playback mode.
- Set the DUBBING MODE button to NORMAL.
- Adjust RV71 so that the frequency counter reading becomes $3,000 \pm 30$ Hz.

Frequency difference between the deck A and deck B the beginning of the tape should be within $\pm 1\%$.

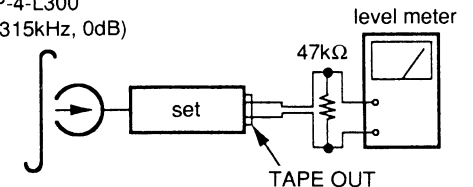
Adjustment Location : AUDIO board. (See page 9)

Playback Level Adjustment DECK-A DECK-B

Procedure :

Mode : Forward Playback

test tape
P-4-L300
(315kHz, 0dB)



Adjust RV11 (L-CH) and RV21 (R-CH), so the level meter reading becomes the adjustment Level below.

Adjustment Level :

TAPE OUT level : -7.4 ± 1 dB (0.294 to 0.37 V)

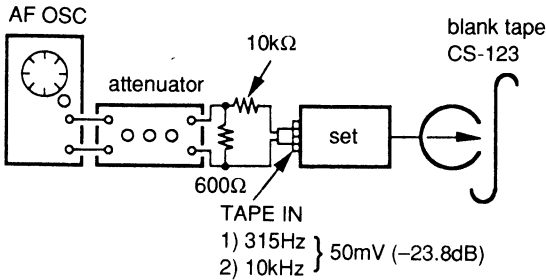
Level difference between channels : within 0.5 dB.

Confirm the TAPE OUT level does not change in playback mode while changing the mode from playback to stop several times.

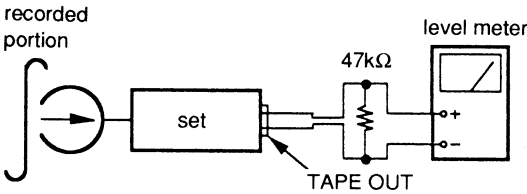
Adjustment Location : AUDIO board. (See page 9)

Record Bias Adjustment **DECK-B**

Procedure :
1. Mode : Record



2. Mode : Playback

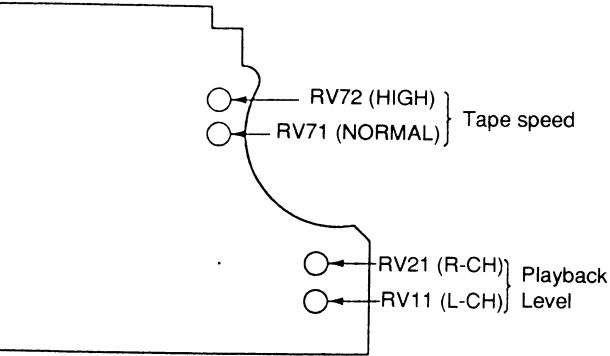


Confirm that the 10 kHz playback output is 0 ± 0.5 dB relative to the 315 Hz output. If necessary, adjust RV12 (L-CH), RV22 (R-CH) and repeat the steps given above.

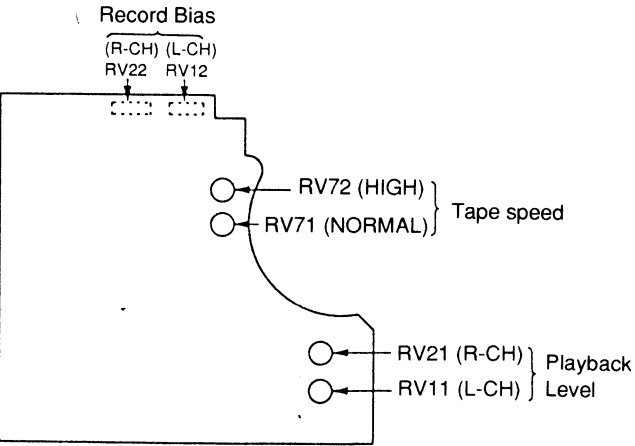
Adjustment Location : AUDIO board. (See page 9)

— Adjustment Parts Location Diagrams —

DECK A :
[MAIN BOARD] — Conductor side —

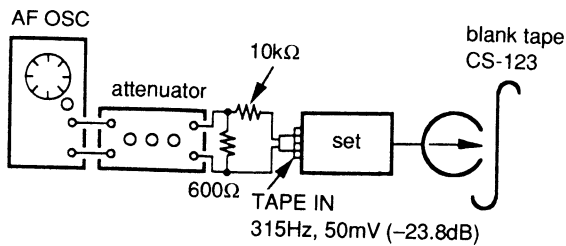


DECK B :
[AUDIO BOARD] — Conductor side —

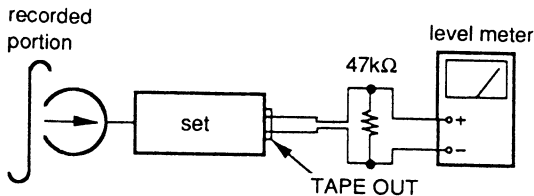


Record Level Adjustment **DECK-B**

Procedure :
1. Mode : Record



2. Mode : Playback

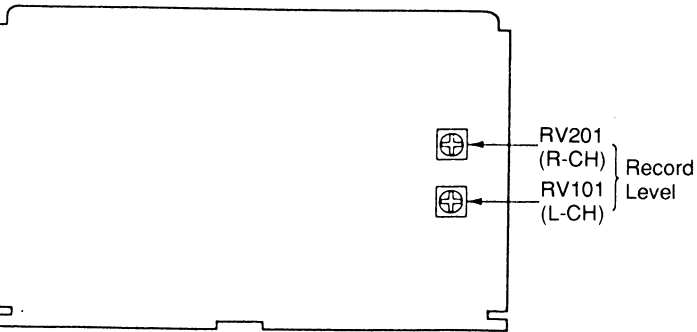


Confirm playback the tape recorded become adjustment level as follows.
If necessary, adjust RV101 (L-CH), RV201 (R-CH) and repeat the steps 1 and 2.

Adjustment level :
TAPE OUT level : -23.8 ± 0.5 dB (47.2 to 53 mV)

Adjustment Location : TC MAIN board. (See page 9)

[TC MAIN BOARD] — Component side —



SECTION 5
DIAGRAMS

5-1. IC PIN FUNCTION

• IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)

Pin No.	Pin Name	I/O	Function
1	B HALF	I	B Half detection input. "L": Presence "H": Nothing
2	KEY 3	I	Key input. (A/D converter analog input)
3	KEY 2	I	
4	KEY 1	I	
5	TEST	I	Electrical adjustment test mode setting. "L": Test mode
6	DISP RST	O	GND
7	DISP SYNC	O	
8	DISP CLK	O	
9	DISP OUT	O	
10	DISP IN	O	
11	B REEL 2	O	Deck B reel motor control output.
12	B REEL 3	O	
13	B REEL 1	O	
14	A REEL 1	O	Deck A reel motor control output.
15	A REEL 3	O	
16	A REEL 2	O	
17	PWR IN	I	+5V power supply input.
18	AUB IN	I	Audio bus input.
19	NRST	I	Microcomputer reset input.
20	AUB OUT	O	Audio bus output.
21	XC OUT	O	Not used. (GND)
22	X IN	I	Oscillator connection pins. (4 MHz)
23	X OUT	O	
24	Vss	-	GND
25	VER	-	
26	PWR OUT	O	Not used. (Open)
27	LINE MUTE	O	Line mute ON/OFF. "L": ON
28	BIAS	O	Bias oscillation control output. "L": ON
29	NC	-	GND
30	DAT FUNC	O	DAT mute output.
31	CD FUNC	O	CD mute output.
32	PASS	O	PASS amplifier switch output to dolby.
33	EQ H/L	O	REC equalizer switching output. "L": High speed "H": Normal speed
34	REC MUTE	O	REC mute output.
35	PB SEL	O	Play mode deck A/B select output. "L": DECK A "H": DECK B
36	AMS G SEL	O	AMS/BS mode select output. "H": AMS mode "L": BS mode
37	1599 MUTE	O	Mute output to IC101 (CXA1599Q). "H": ON "L": OFF
38	NC	-	Not used. (+5V)
39	NR RELAY	O	ALC (Automatic Level Control) control output.
40	CD SYNC	O	CD synchro dubbing LED output. "H": ON "L": OFF

Pin No.	
41	DUB
42	DUB
43	PAU
44	REC
45	B <
46	B >
47	A <
48	A >
49	B ST
50	A ST
51	+7.5V
52	REL
53	REC
54	CAP
55	B CA
56	A CA
57	VDD
58	VEE
59	AVSS
60	VREF
61	A HA
62	BS. F
63	AS. F
64	AMS

SECTION 5
DIAGRAMS

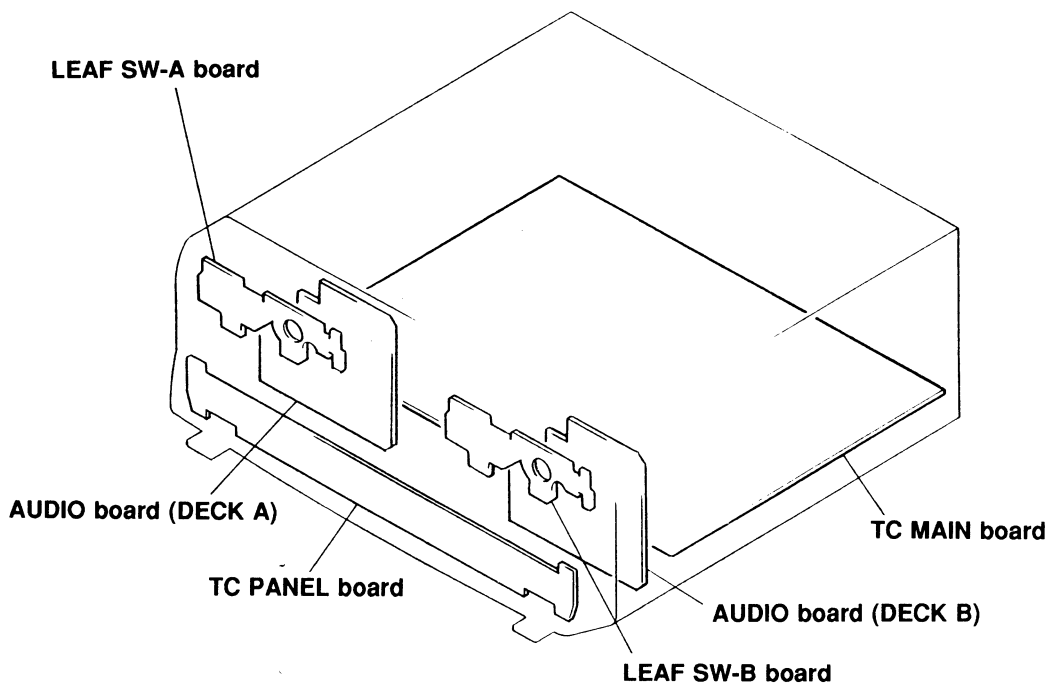
5-1. IC PIN FUNCTION

• IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)

Pin No.	Pin Name	I/O	Function
1	B HALF	I	B Half detection input. "L": Presence "H": Nothing
2	KEY 3	I	Key input. (A/D converter analog input)
3	KEY 2	I	
4	KEY 1	I	
5	TEST	I	Electrical adjustment test mode setting. "L": Test mode
6	DISP RST	O	GND
7	DISP SYNC	O	
8	DISP CLK	O	
9	DISP OUT	O	
10	DISP IN	O	
11	B REEL 2	O	Deck B reel motor control output.
12	B REEL 3	O	
13	B REEL 1	O	
14	A REEL 1	O	Deck A reel motor control output.
15	A REEL 3	O	
16	A REEL 2	O	
17	PWR IN	I	+5V power supply input.
18	AUB IN	I	Audio bus input.
19	NRST	I	Microcomputer reset input.
20	AUB OUT	O	Audio bus output.
21	XC OUT	O	Not used. (GND)
22	X IN	I	Oscillator connection pins. (4 MHz)
23	X OUT	O	
24	Vss	—	GND
25	VER	—	
26	PWR OUT	O	Not used. (Open)
27	LINE MUTE	O	Line mute ON/OFF. "L": ON
28	BIAS	O	Bias oscillation control output. "L": ON
29	NC	—	GND
30	DAT FUNC	O	DAT mute output.
31	CD FUNC	O	CD mute output.
32	PASS	O	PASS amplifier switch output to dolby.
33	EQ H/L	O	REC equalizer switching output. "L": High speed "H": Normal speed
34	REC MUTE	O	REC mute output.
35	PB SEL	O	Play mode deck A/B select output. "L": DECK A "H": DECK B
36	AMS G SEL	O	AMS/BS mode select output. "H": AMS mode "L": BS mode
37	1599 MUTE	O	Mute output to IC101 (CXA1599Q). "H": ON "L": OFF
38	NC	—	Not used. (+5V)
39	NR RELAY	O	ALC (Automatic Level Control) control output.
40	CD SYNC	O	CD synchro dubbing LED output. "H": ON "L": OFF

Pin No.	Pin Name	I/O	Function
41	DUB H	O	High speed dubbing LED output. "H": ON "L": OFF
42	DUB N	O	Normal speed dubbing LED output. "H": ON "L": OFF
43	PAUSE	O	PAUSE LED output. "H": ON "L": OFF
44	REC	O	REC LED output. "H": ON "L": OFF
45	B◁	O	Deck B REV LED output. "H": ON "L": OFF
46	B▷	O	Deck B FWD LED output. "H": ON "L": OFF
47	A◁	O	Deck A REV LED output. "H": ON "L": OFF
48	A▷	O	Deck A FWD LED output. "H": ON "L": OFF
49	B STOP SW	I	Deck B stop detect input. "H": STOP
50	A STOP SW	I	Deck A stop detect input. "H": STOP
51	+7.5V DET	I	+7.5V power supply detect input.
52	RELAY	O	Control output to REC/PB select output. "H": REC "L": PLAY
53	REC/PB	O	Dolby IC (IC103) REC/PB select output. "H": REC "L": PLAY
54	CAP. MOT H/L	O	Capstan motor HIGH/LOW select output. "H": HIGH "L": LOW
55	B CAP. MOTOR	O	Deck B capstan motor control output. "H": ON "L": OFF
56	A CAP. MOTOR	O	Deck A capstan motor control output. "H": ON "L": OFF
57	VDD	—	+5V power supply.
58	VEE	—	
59	AVss	—	GND
60	VREF	I	
61	A HALF	I	A/D converter reference power supply +5V.
62	BS. REEL IN	I	Deck B reel table signal input.
63	AS. REEL IN	I	Deck A reel table signal input.
64	AMS IN	I	AMS input. "L": No song "H": Song

5-2. CIRCUIT BOARDS LOCATION



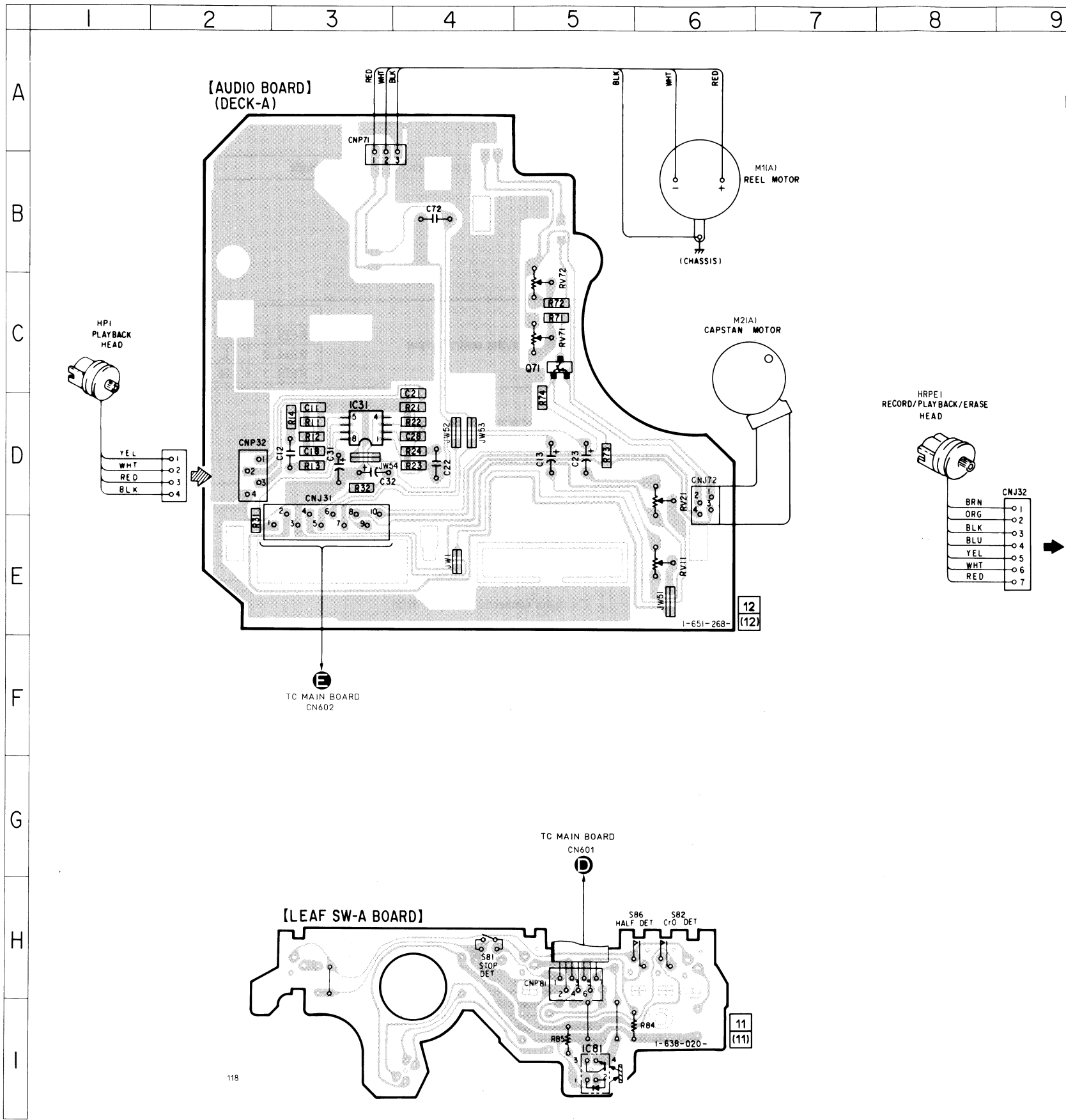
• Semiconductor Location

Ref. No.	Location
IC31 (DECK A)	D-3
IC31 (DECK B)	D-10
IC32	D-11
IC81 (DECK A)	I-5
IC81 (DECK B)	I-13
Q51	C-11
Q52	B-11
Q53	C-11
Q71 (DECK A)	C-5
Q71 (DECK B)	D-13

Note:

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : Pattern from the side which enable seeing.

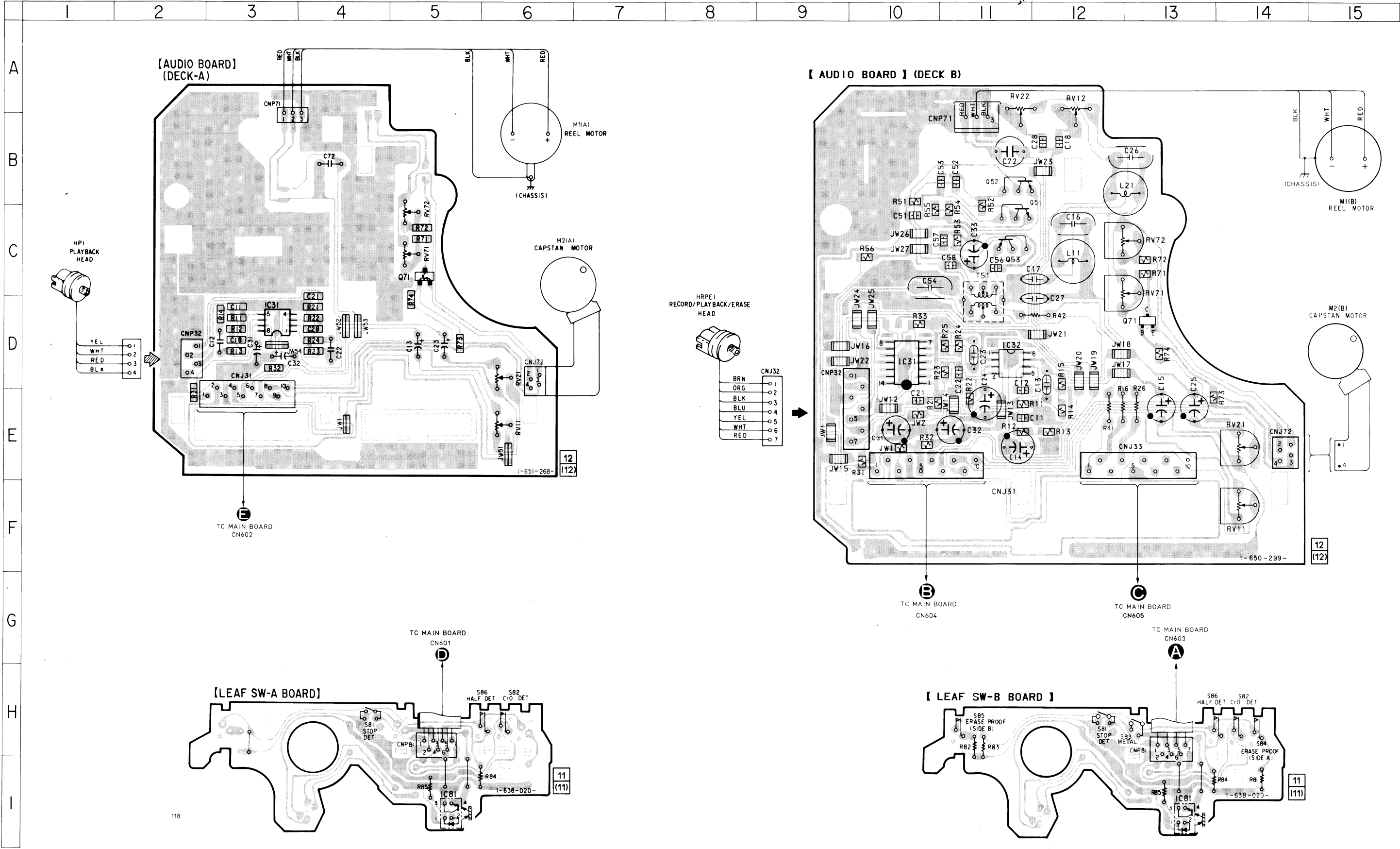
5-3. PRINTED WIRING BOARD — AUDIO SECTION —



5-3. PRINTED WIRING BOARD — AUDIO SECTION —

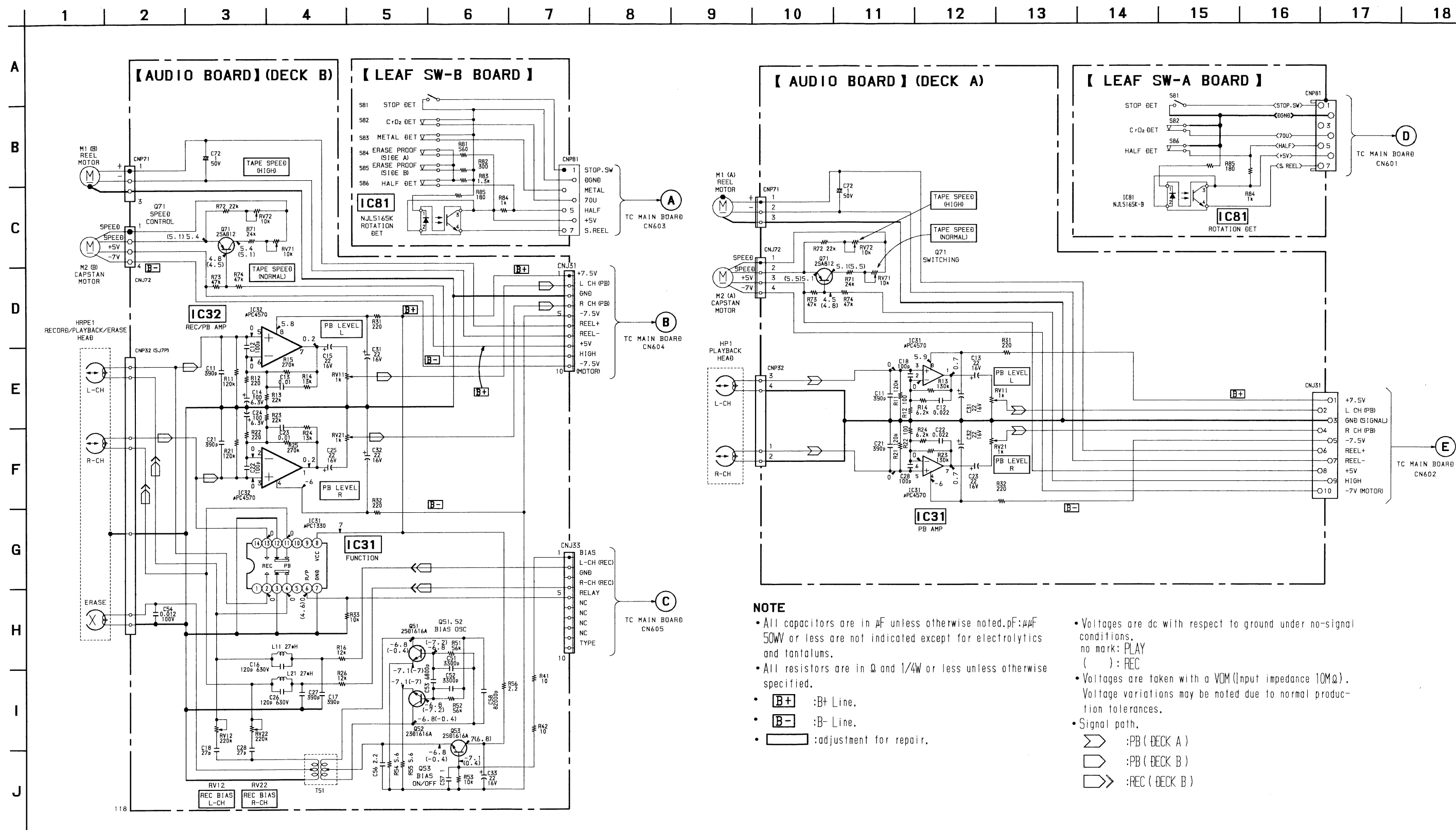
Conductor
on

Conductor	Location
CK A)	D-3
CK B)	D-10
CK A)	D-11
CK B)	I-5
CK A)	I-13
CK B)	I-13
CK A)	C-11
CK B)	B-11
CK A)	C-11
CK B)	C-5
CK A)	D-13
CK B)	D-13



Component side.
Conductor side.
Notable seeing.

5-4. SCHEMATIC DIAGRAM — AUDIO SECTION —







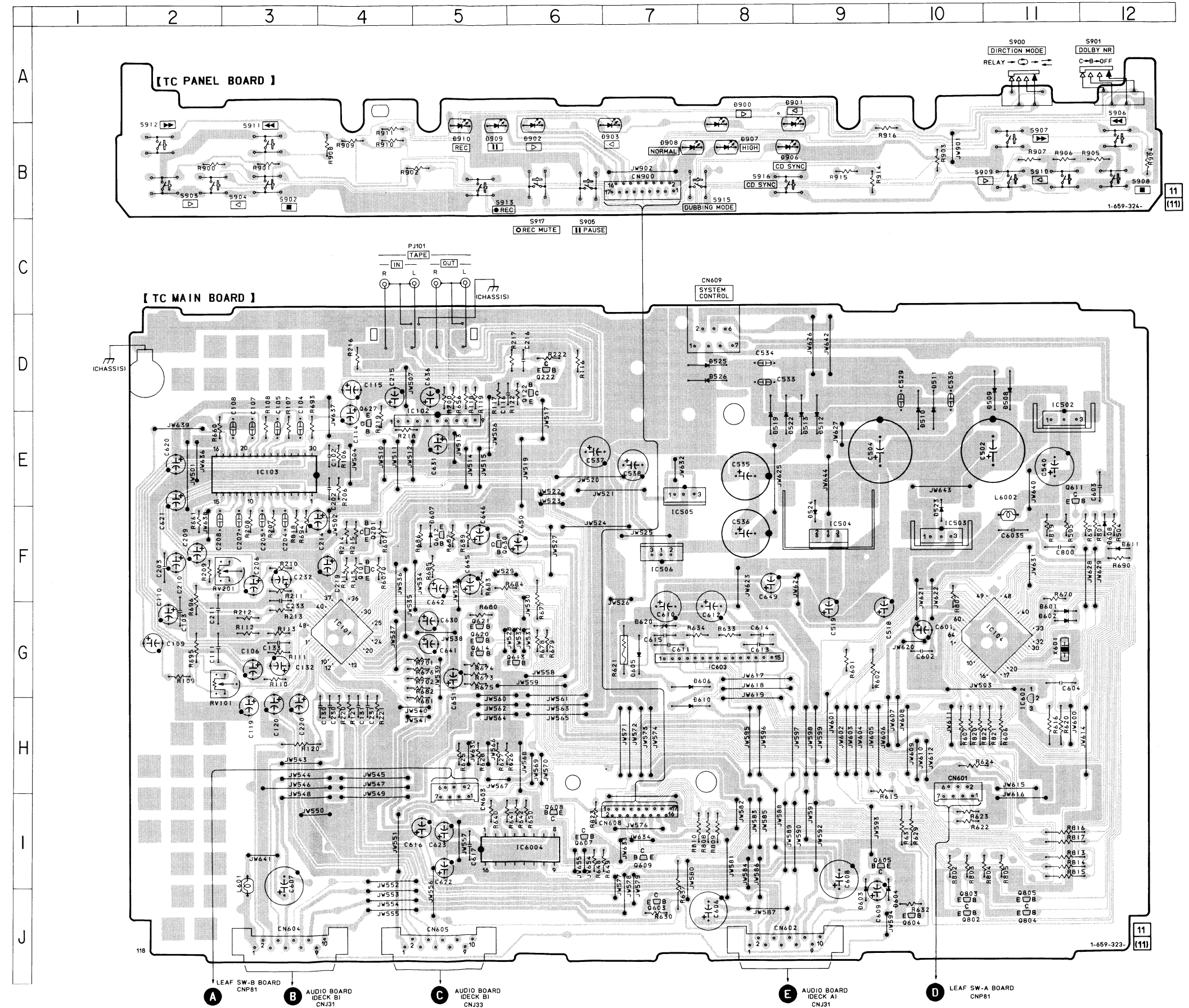
5-5. PRINTED WIRING BOARD — TC SECTION —
• See page 12 for Circuit Boards Location.

- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D508	D-11	IC102	E-5
D509	D-11	IC103	E-3
D510	E-10	IC104	G-11
D511	E-10	IC502	E-11
D512	E-9	IC503	F-10
D513	E-9	IC504	F-9
D519	E-8	IC505	E-7
D522	E-8	IC506	F-7
D523	F-10	IC602	H-11
D524	F-9	IC603	G-8
D525	D-8	IC6004	I-6
D526	D-8		
D601	G-11	Q101	F-4
D602	G-11	Q122	D-6
D603	J-9	Q201	F-4
D604	J-9	Q222	D-6
D605	G-7	Q603	J-7
D606	G-7	Q604	J-10
D607	F-5	Q605	I-9
D608	F-12	Q607	I-6
D610	H-7	Q608	I-6
D611	F-12	Q609	I-7
D620	G-7	Q611	F-11
D900	B-8	Q612	F-5
D901	B-8	Q613	G-6
D902	B-6	Q614	G-5
D903	B-7	Q620	G-5
D906	B-8	Q621	G-5
D907	B-8	Q627	E-4
D908	B-7	Q630	F-5
D909	B-5	Q802	J-10
D910	B-5	Q803	J-10
		Q804	J-11
IC101	G-4	Q805	J-11

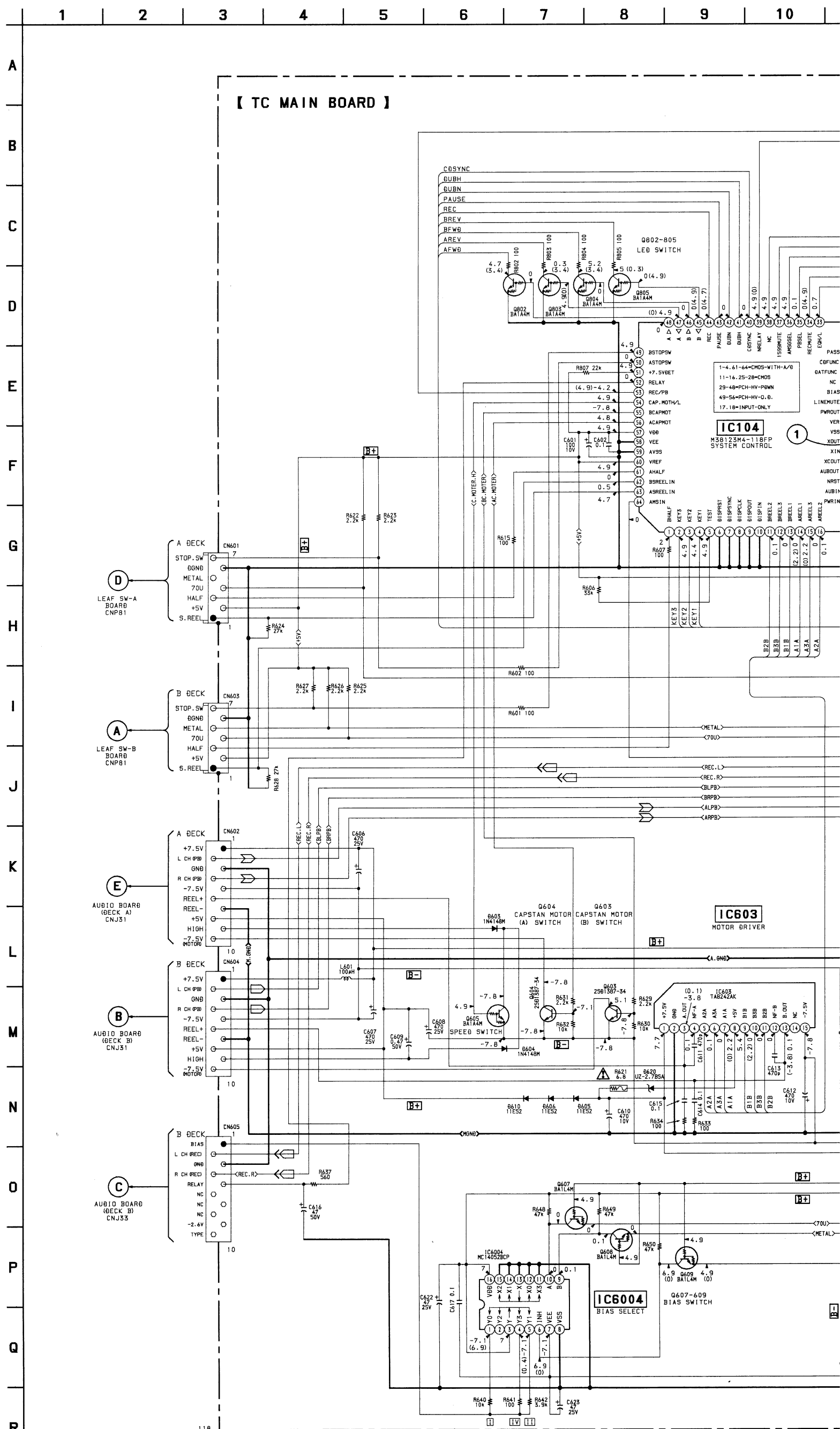
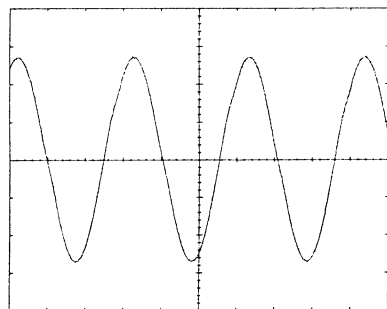
Note:

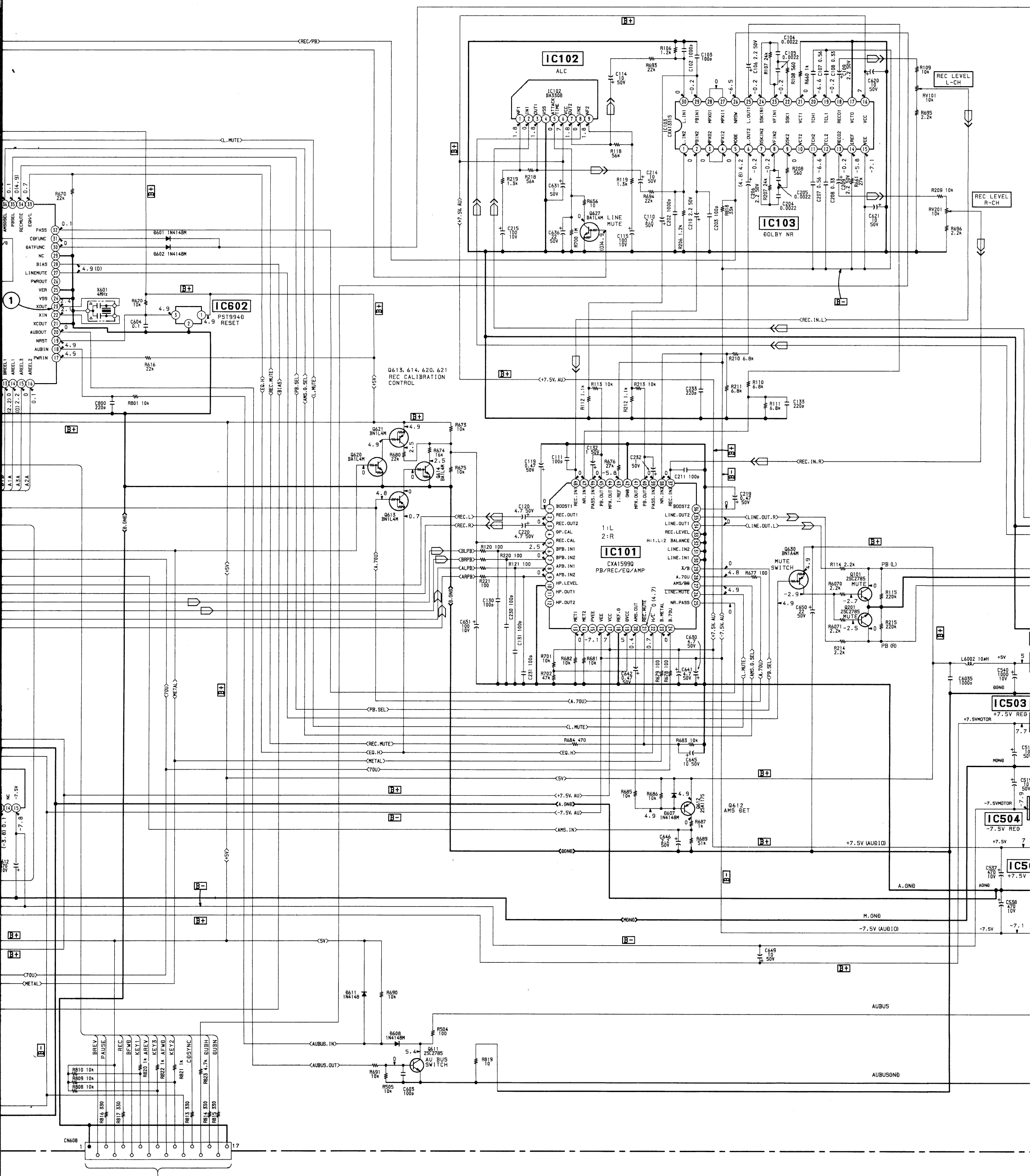
-  : parts extracted from the component side.
-  : parts extracted from the conductor side.
-  : internal component.
-  : Pattern from the side which enable seeing.

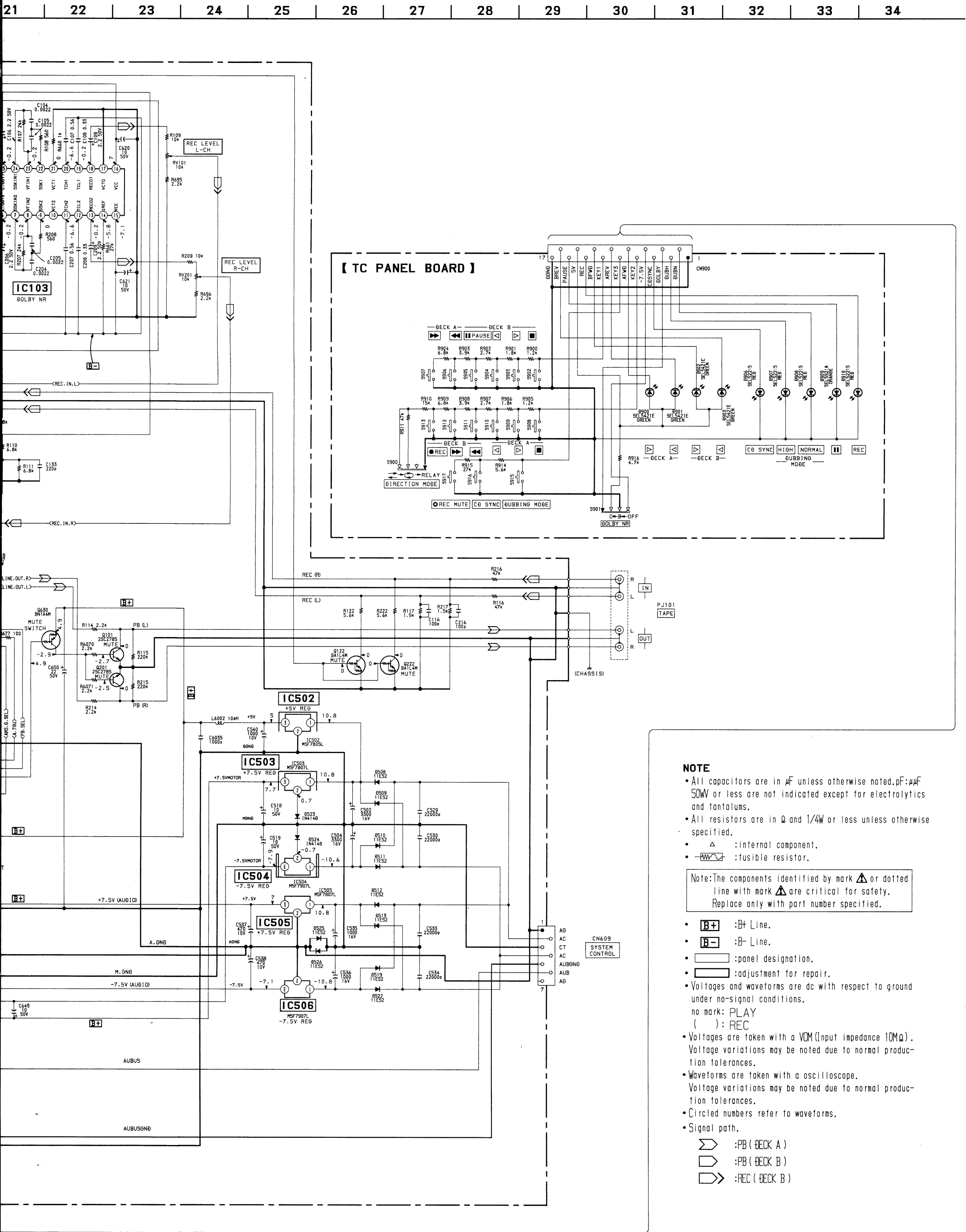


- See page 10 for IC Pin function. (IC104)
- See page 23 for IC Block Diagrams.

① IC104 ② 4.5 V_{p-p} 4MHz







NOTE

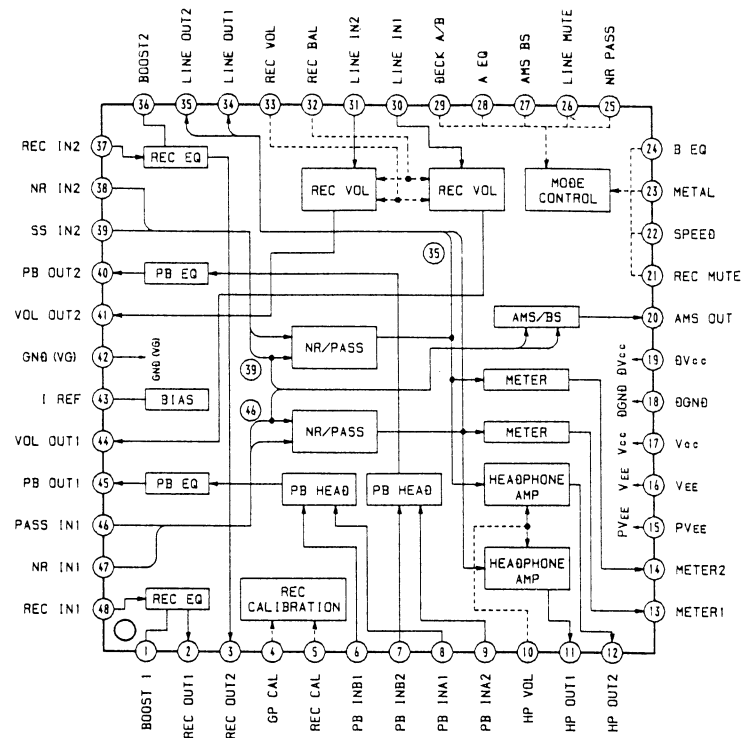
- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F} \times 10^{-6}$. 50W or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- Δ : internal component.
- $\text{---}\text{---}\text{---}$: fusible resistor.

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

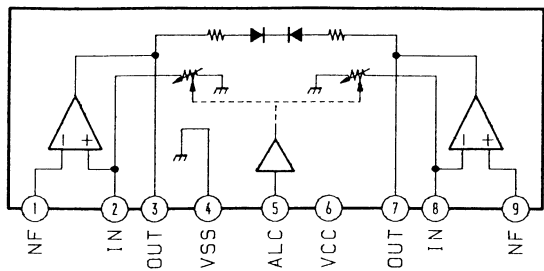
- **B+** : B+ Line.
- **B-** : B- Line.
- **□** : panel designation.
- **□** : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
no mark: PLAY
() : REC
- Voltages are taken with a VOM (input impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
 - $\text{---}\text{---}\text{---}$: PB (DECK A)
 - $\text{---}\text{---}\text{---}$: PB (DECK B)
 - $\text{---}\text{---}\text{---}$: REC (DECK B)

5-7. IC BLOCK DIAGRAMS

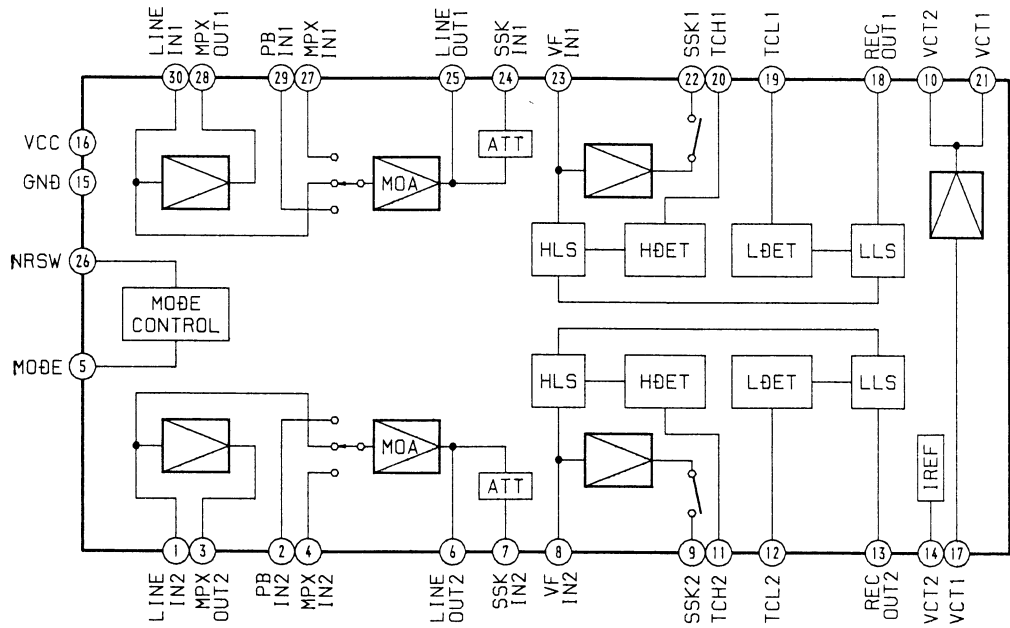
IC101 CXA1599Q



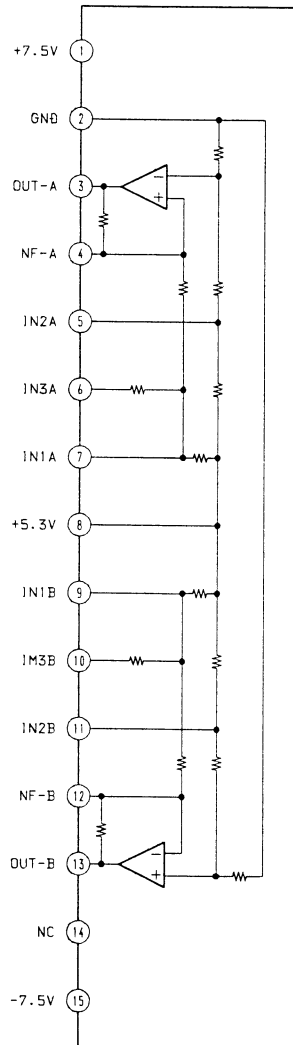
IC102 BA3308



IC103 CXA1331S



IC603 TA8242AK





SECTION 6
EXPLODED VIEWS

6-2. FRO

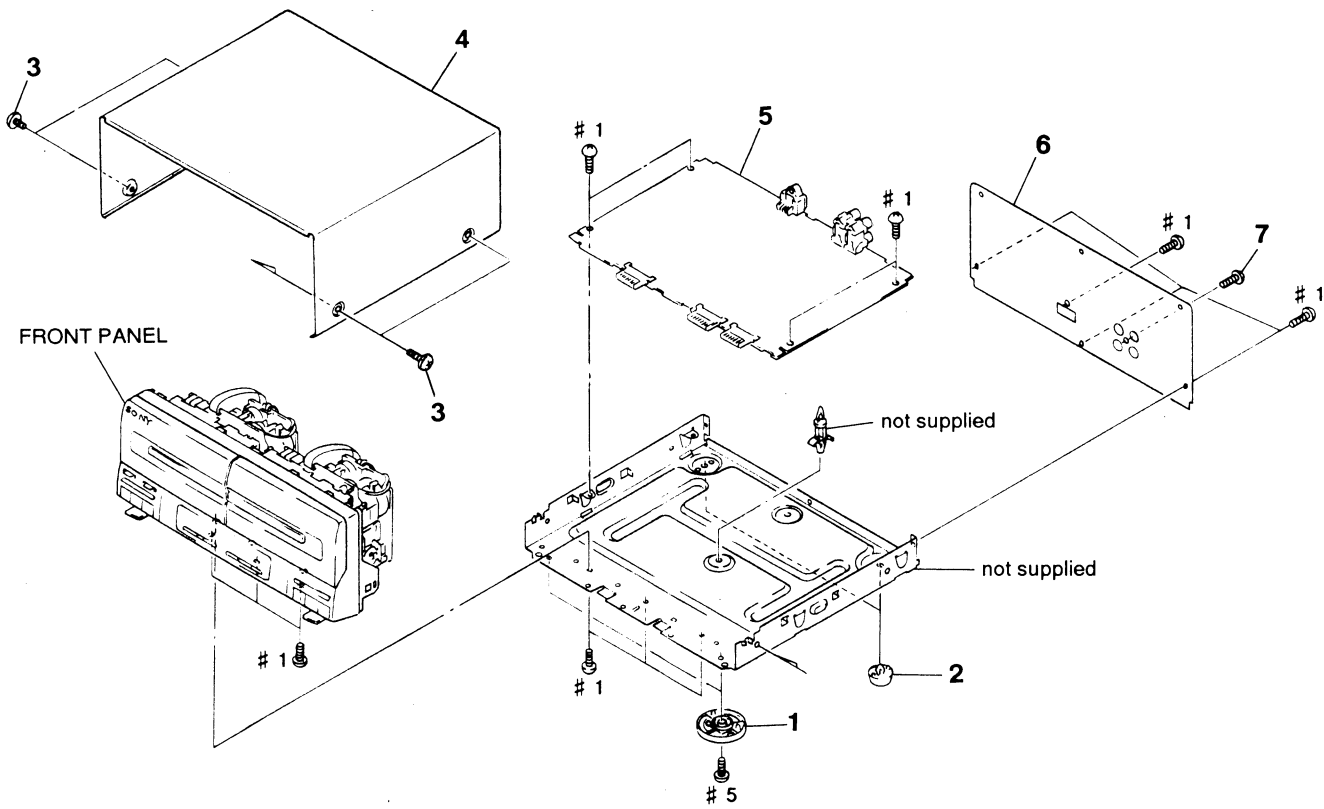
NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
KNOB, BALANCE (WHITE) ... (RED)
Parts color Cabinet's color

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
EA : Saudi Arabia model
TH : Thailand model

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

6-1. CHASSIS SECTION

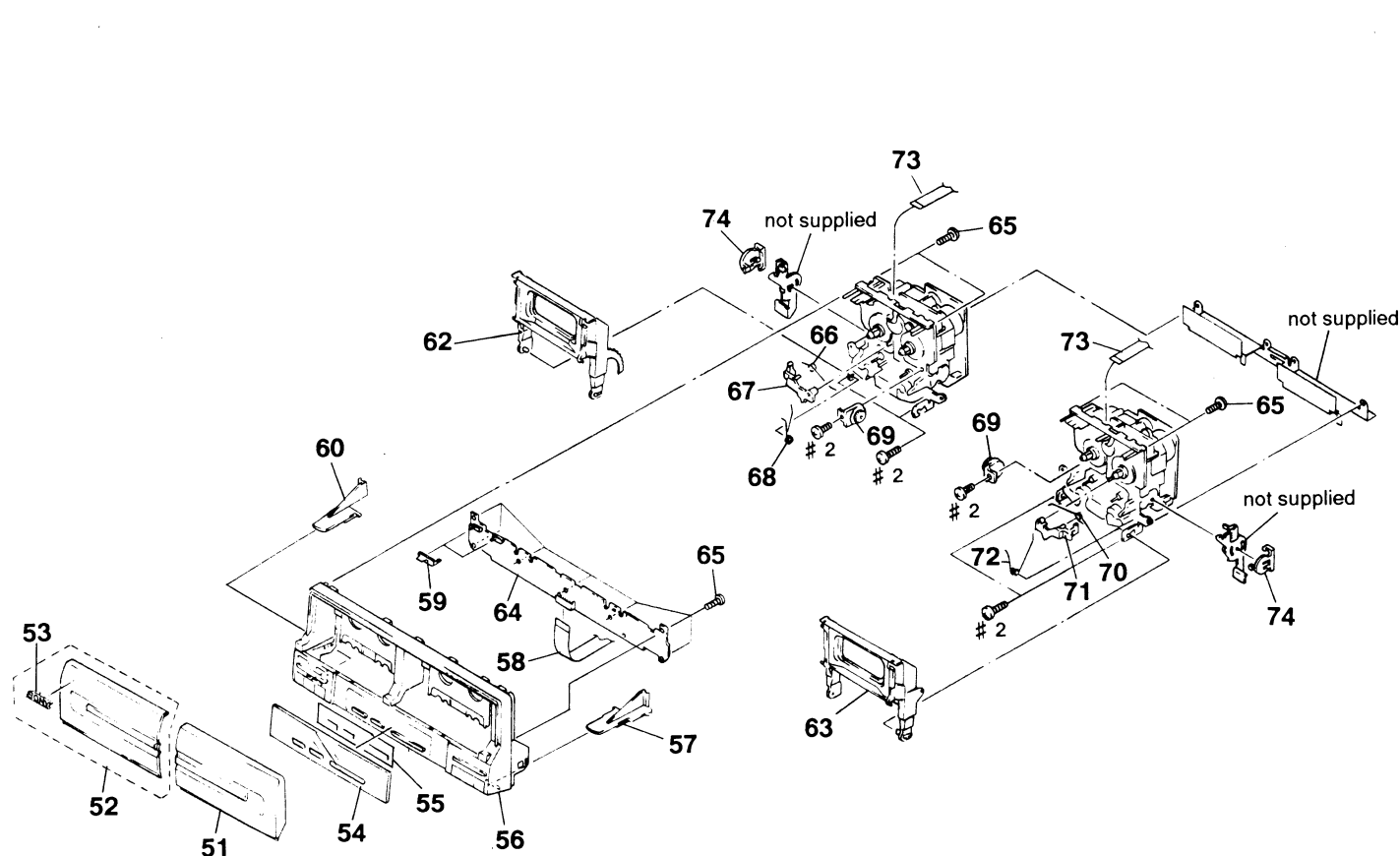


Ref. No.	Part No.	Description
1	4-977-699-11	LEG (F)
2	4-965-822-01	FOOT
3	3-363-099-01	SCREW (CASE 3 TP2)
* 4	4-978-245-51	CASE (SILVER)
* 4	4-978-245-71	CASE (BLACK)
* 5	A-2007-477-A	TC MAIN BOARD, COMPLETE
* 6	4-978-260-01	PANEL, BACK (EX100:AEP,UK)
* 6	4-978-260-11	PANEL, BACK (EX100:E)

Remark	Ref. No.	Part No.	Description
	* 6	4-978-260-21	PANEL, BACK (EX100:EA)
	* 6	4-978-260-31	PANEL, BACK (EX100:TH)
	* 6	4-978-260-41	PANEL, BACK (EX90:AEP,UK)
	* 6	4-978-260-51	PANEL, BACK (EX90:E)
	* 6	4-978-260-61	PANEL, BACK (EX90:EA)
	* 6	4-978-260-71	PANEL, BACK (EX90:TH)
	7	3-704-515-01	SCREW (BV/RING)

Ref. No.	Part No.	Description
51	X-3	
51	X-4	
52	X-3	
52	X-4	
53	4-9	
54	X-4	
55	4-9	
56	X-3	
56	X-4	
57	4-9	
57	4-9	
58	1-7	
59	4-9	
59	4-9	
60	4-9	
60	4-9	

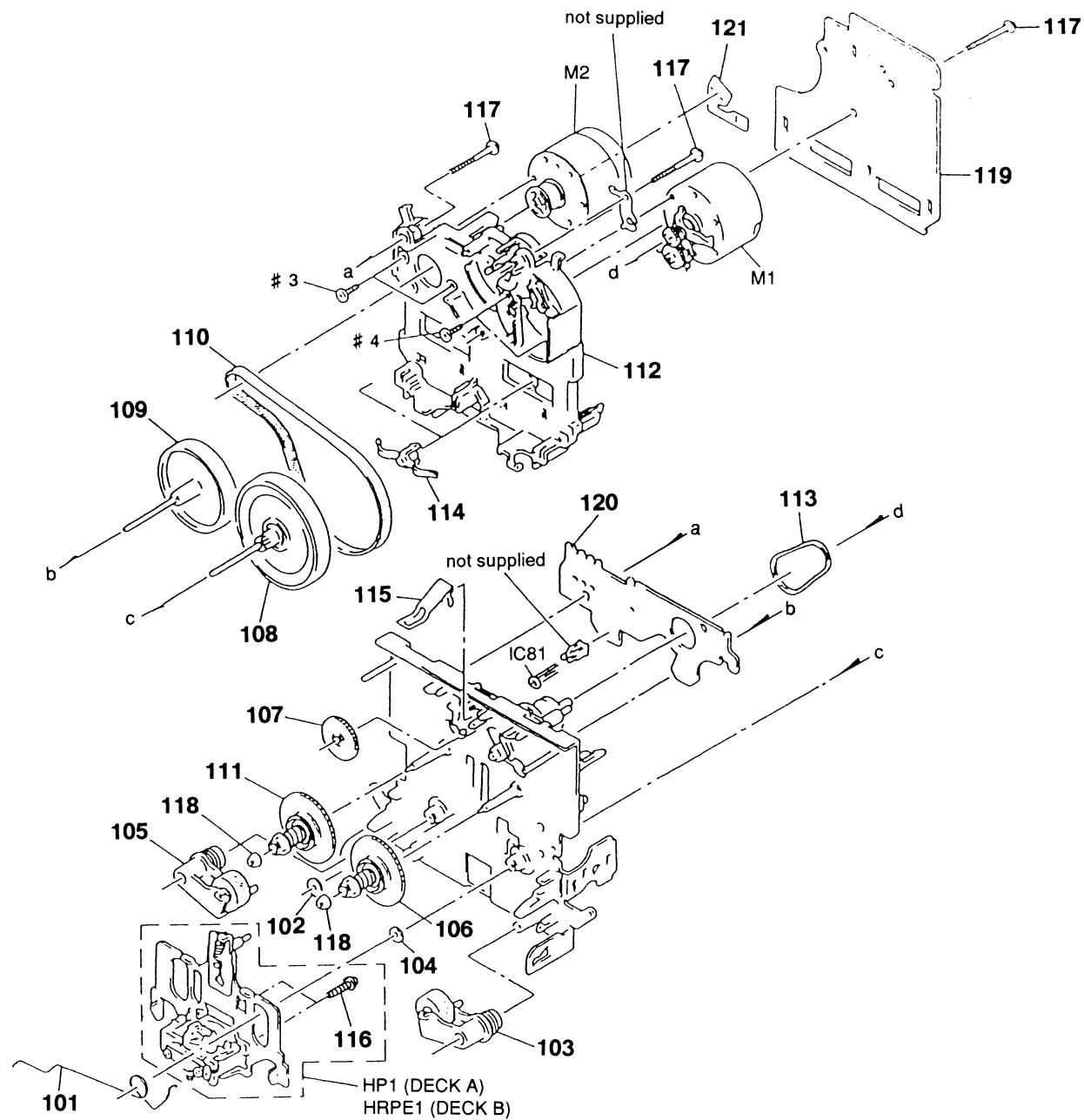
6-2. FRONT PANEL SECTION



Ref.No.	Part No.	Description	Remark
51	X-3371-674-1	LID (B) ASSY, CASSETTE (BLACK)	
51	X-4946-613-1	LID (B) ASSY, CASSETTE (SILVER)	
52	X-3371-673-1	LID (A) ASSY, CASSETTE (BLACK)	
52	X-4946-612-1	LID (A) ASSY, CASSETTE (SILVER)	
53	4-962-708-11	EMBLEM (4-A), SONY	
54	X-4947-183-1	WINDOW ASSY	
55	4-978-257-01	ILLUMINATOR	
56	X-3371-672-1	PANEL ASSY, FRONT (BLACK)	
56	X-4946-611-1	PANEL ASSY, FRONT (SILVER)	
57	4-978-255-01	LEVER (EJECT-B) (SILVER)	
57	4-978-255-11	LEVER (EJECT-B) (BLACK)	
58	1-769-390-11	WIRE (FLAT TYPE) (17 CORE)	
59	4-978-256-01	KNOB (SLIDE) (SILVER)	
59	4-978-256-11	KNOB (SLIDE) (BLACK)	
60	4-978-254-01	LEVER (EJECT-A) (SILVER)	
60	4-978-254-11	LEVER (EJECT-A) (BLACK)	

Ref.No.	Part No.	Description	Remark
62	X-3371-697-1	HOLDER (L) ASSY, CASSETTE (TH)	
62	X-3372-081-1	HOLDER (L) ASSY, CASSETTE (AEP, UK, E, EA)	
63	X-3371-698-1	HOLDER (R) ASSY, CASSETTE (TH)	
63	X-3372-082-1	HOLDER (R) ASSY, CASSETTE (AEP, UK, E, EA)	
* 64	A-2007-478-A	TC PANEL BOARD, COMPLETE	
65	4-951-620-01	SCREW (2.6X8), +BVTP	
66	3-354-961-01	SPRING (EJ SAFTY SPRING L)	
67	3-354-955-01	LEVER (EJ SAFTY LEVER L)	
68	4-959-231-11	SPRING (L), TORSION	
69	3-354-963-01	DAMPER	
70	3-354-962-01	SPRING (EJ SAFTY SPRING R)	
71	3-354-956-01	LEVER (EJ SAFTY LEVER R)	
72	4-959-232-11	SPRING (R), TORSION	
73	1-765-384-11	WIRE (FLAT TYPE) (7 CORE)	
74	3-354-957-01	JOINT (LOCK LEVER)	

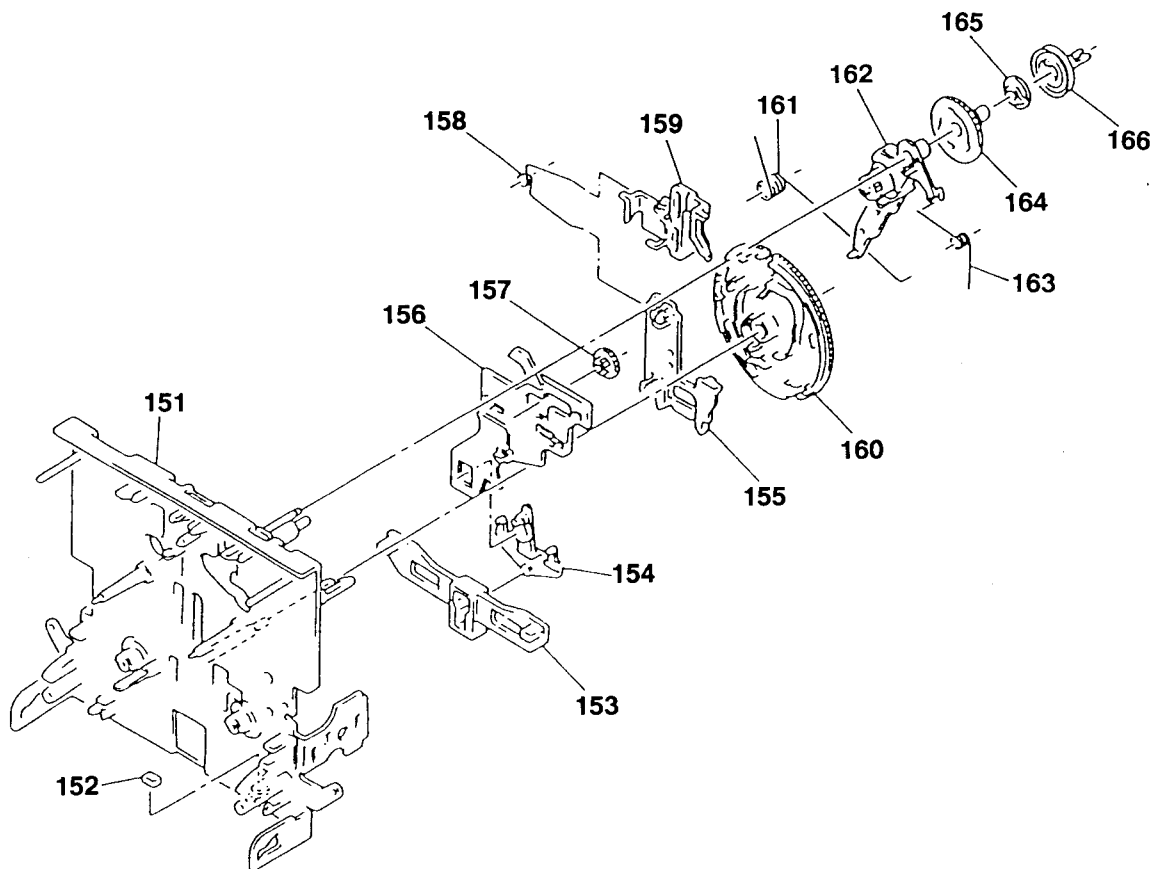
6-3. MECHANISM SECTION-1
(DECK A: TCM-190RA12CL)
(DECK B: TCM-190RB52C)



Ref.No.	Part No.	Description	Remark
101	3-907-362-01	SPRING, TORSION	
102	3-356-714-01	WASHER	
103	X-3366-047-1	LEVER (PINCH F) ASSY	
104	3-356-713-01	WASHER	
105	X-3366-048-1	LEVER (PINCH R) ASSY	
106	X-3366-971-1	TABLE ASSY (B), REEL (DECK A)	
106	X-3369-508-1	TABLE (C) ASSY, REEL (DECK B)	
107	3-359-424-01	GEAR (REV GEAR)	
108	X-3367-629-1	FLYWHEEL (FWD) ASSY	
109	X-3359-410-1	FLYWHEEL (REV) ASSY (DECK A)	
109	X-3367-630-1	FLYWHEEL (REV) ASSY (DECK B)	
110	3-359-417-01	BELT (FLAT), CAPSTAN	
111	X-3366-970-1	TABLE ASSY, REEL	
112	3-359-436-11	BASE (THRUST RETAINER), FITTING	
113	3-359-466-01	BELT (FR), SQUARE	

Ref.No.	Part No.	Description	Remark
114	3-575-321-00	RETAINER, THRUST, CAPSTAN	
115	3-359-430-01	SPRING (CASSETTE RETAINER), LEAF	
116	3-388-848-01	SCREW (P2X6) (B TIGHT)	
117	3-359-414-01	SCREW (+PTPH 2X23)	
118	3-362-308-01	CAP (REEL)	
* 119	A-2007-266-A	AUDIO BOARD, COMPLETE (DECK A)	
* 119	A-2007-133-A	AUDIO BOARD, COMPLETE (DECK B)	
* 120	1-638-020-11	LEAF SW-A BOARD	
* 120	1-638-020-11	LEAF SW-B BOARD	
121	1-638-983-11	MOTOR FLEXIBLE BOARD	
HP1	A-2003-757-A	BASE ASSY, HEAD (PB) (DECK A)	
HRPE1	A-2003-930-A	BASE ASSY, HEAD (PB/REC/ERASE) (DECK A)	
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(H1)	
M1	X-3363-501-2	MOTOR ASSY (REEL)	
M2	X-3365-377-2	MOTOR ASSY (CAPSTAN)	

6-4. MECHANISM SECTION-2
(DECK A: TCM-190RA12CL)
(DECK B: TCM-190RB52C)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	X-3359-415-1	CHASSIS ASSY, MECHANICAL		159	3-359-429-11	SLIDER (BRAKE PLATE) (DECK B)	
152	3-359-469-01	SPACER		160	3-359-420-01	GEAR (CAM GEAR)	
153	3-359-425-01	SLIDER (REVERSE SLIDER)		161	3-359-456-01	SPRING (TRIGGER SPRING), TORSION	
154	3-359-426-01	LEVER (REVERSE LEVER)		162	X-3366-569-1	ARM ASSY, FR	
155	3-359-427-01	SLIDER (LEVERSE SLIDER)		163	3-924-185-11	SPRING (FR ARM), TORSION	
* 156	3-359-415-01	SLIDER (TRIGGER SLIDER) (DECK A)		164	3-359-419-11	GEAR (FR GEAR)	
156	3-359-415-11	SLIDER (TRIGGER SLIDER) (DECK B)		165	3-359-421-01	CLUTCH (REEL DISK)	
157	3-359-448-01	GEAR (TRIGGER)		166	3-359-418-01	PULLEY (FR PULLEY)	
158	3-359-454-01	SPRING, TORSION					
159	3-359-429-01	SLIDER (BRAKE PLATE) (DECK A)					

AUDIO

SECTION 7 ELECTRICAL PARTS LIST

NOTE:

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F : nonflammable

- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
uPC...: μ PC..., uPD...: μ PD...
- CAPACITORS
uF : μ F
- COILS
uH : μ H

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
*	A-2007-266-A	AUDIO BOARD, COMPLETE (DECK A) *****		R23	1-216-100-00	METAL GLAZE 130K 5% 1/10W	
		< CAPACITOR >		R24	1-216-068-00	METAL CHIP 6.2K 5% 1/10W	
C11	1-163-131-00	CERAMIC CHIP 390PF 5% 50V		R31	1-216-033-00	METAL CHIP 220 5% 1/10W	
C12	1-136-157-00	FILM 0.022uF 5% 50V		R32	1-216-033-00	METAL CHIP 220 5% 1/10W	
C13	1-124-234-00	ELECT 22uF 20% 16V		R71	1-216-082-00	METAL GLAZE 24K 5% 1/10W	
C18	1-163-251-11	CERAMIC CHIP 100PF 5% 50V		R72	1-216-081-00	METAL CHIP 22K 5% 1/10W	
C21	1-163-131-00	CERAMIC CHIP 390PF 5% 50V		R73	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
				R74	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
C22	1-136-157-00	FILM 0.022uF 5% 50V				< VARIABLE RESISTOR >	
C23	1-124-234-00	ELECT 22uF 20% 16V		RV11	1-241-761-11	RES, ADJ, CARBON 1K	
C28	1-163-251-11	CERAMIC CHIP 100PF 5% 50V		RV21	1-241-761-11	RES, ADJ, CARBON 1K	
C31	1-124-234-00	ELECT 22uF 20% 16V		RV71	1-241-630-11	RES, ADJ, CARBON 10K	
C32	1-124-234-00	ELECT 22uF 20% 16V		RV72	1-241-630-11	RES, ADJ, CARBON 10K	
C72	1-109-889-11	ELECT 1uF 20% 50V		*****			
		< CONNECTOR >		*	A-2007-133-A	AUDIO BOARD, COMPLETE (DECK B) *****	
* CNJ31	1-580-782-11	CONNECTOR, BOARD TO BOARD				< CAPACITOR >	
CNJ72	1-764-902-11	CONNECTOR, FFC/FPC 4P		C11	1-163-131-00	CERAMIC CHIP 390PF 5% 50V	
* CNP32	1-580-772-11	PIN, CONNECTOR (PC BOARD) 4P		C12	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
* CNP71	1-564-719-11	PIN, CONNECTOR (SMALL TYPE) 3P		C13	1-136-153-00	FILM 0.01uF 5% 50V	
		< IC >		C14	1-126-177-11	ELECT 100uF 20% 10V	
IC31	8-759-106-02	IC uPC4570G2		C15	1-124-234-00	ELECT 22uF 20% 16V	
		< JUMPER RESISTOR >		C16	1-136-434-11	FILM 120PF 5% 630V	
JW1	1-216-295-91	CONDUCTOR, CHIP (2012)		C17	1-102-113-00	CERAMIC 390PF 10% 50V	
JW51	1-216-296-91	CONDUCTOR, CHIP (3216)		C18	1-163-237-11	CERAMIC CHIP 27PF 5% 50V	
JW52	1-216-296-91	CONDUCTOR, CHIP (3216)		C21	1-163-131-00	CERAMIC CHIP 390PF 5% 50V	
JW53	1-216-296-91	CONDUCTOR, CHIP (3216)		C22	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
JW54	1-216-296-91	CONDUCTOR, CHIP (3216)		C23	1-136-153-00	FILM 0.01uF 5% 50V	
		< TRANSISTOR >		C24	1-126-177-11	ELECT 100uF 20% 10V	
Q71	8-729-216-22	TRANSISTOR 2SA1162-G		C25	1-124-234-00	ELECT 22uF 20% 16V	
		< RESISTOR >		C26	1-136-434-11	FILM 120PF 5% 630V	
R11	1-216-099-00	METAL CHIP 120K 5% 1/10W		C27	1-102-113-00	CERAMIC 390PF 10% 50V	
R12	1-216-025-91	METAL GLAZE 100 5% 1/10W		C28	1-163-237-11	CERAMIC CHIP 27PF 5% 50V	
R13	1-216-100-00	METAL GLAZE 130K 5% 1/10W		C31	1-124-234-00	ELECT 22uF 20% 16V	
R14	1-216-068-00	METAL CHIP 6.2K 5% 1/10W		C32	1-124-234-00	ELECT 22uF 20% 16V	
R21	1-216-099-00	METAL CHIP 120K 5% 1/10W		C33	1-124-234-00	ELECT 22uF 20% 16V	
				C51	1-164-182-11	CERAMIC CHIP 0.0033uF 10% 50V	
R22	1-216-025-91	METAL GLAZE 100 5% 1/10W		C52	1-164-182-11	CERAMIC CHIP 0.0033uF 10% 50V	
				C53	1-163-019-00	CERAMIC CHIP 0.0068uF 10% 50V	
				C54	1-107-364-11	FILM 0.012uF 5% 100V	

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C56	1-164-505-11	CERAMIC CHIP	2. 2uF	16V	R13	1-216-081-00 METAL CHIP	22K 5% 1/10W
C57	1-164-346-11	CERAMIC CHIP	1uF	16V	R14	1-216-076-00 METAL CHIP	13K 5% 1/10W
C58	1-163-020-00	CERAMIC CHIP	0. 0082uF	10% 50V	R15	1-216-107-00 METAL CHIP	270K 5% 1/10W
C72	1-109-889-11	ELECT	1uF	20% 50V	R16	1-249-430-11 CARBON	12K 5% 1/4W
< CONNECTOR >				R21	1-216-099-00 METAL CHIP	120K 5% 1/10W	
* CNJ31	1-580-782-11	CONNECTOR, BOARD TO BOARD		R22	1-216-033-00 METAL CHIP	220 5% 1/10W	
* CNJ33	1-580-782-11	CONNECTOR, BOARD TO BOARD		R23	1-216-081-00 METAL CHIP	22K 5% 1/10W	
CNJ72	1-764-902-11	CONNECTOR, FFC/FPC 4P		R24	1-216-076-00 METAL CHIP	13K 5% 1/10W	
* CNP32	1-580-781-11	PIN, CONNECTOR (PC BOARD) 7P		R25	1-216-107-00 METAL CHIP	270K 5% 1/10W	
* CNP71	1-564-719-11	PIN, CONNECTOR (SMALL TYPE) 3P		R26	1-249-430-11 CARBON	12K 5% 1/4W	
< IC >				R31	1-216-033-00 METAL CHIP	220 5% 1/10W	
IC31	8-759-249-21	IC uPC1330AGR		R32	1-216-033-00 METAL CHIP	220 5% 1/10W	
IC32	8-759-106-02	IC uPC4570G2		R33	1-216-073-00 METAL CHIP	10K 5% 1/10W	
< JUMPER RESISTOR >				R41	1-249-393-11 CARBON	10 5% 1/4W	
JW1	1-216-295-91	CONDUCTOR, CHIP	(2012)	R42	1-249-393-11 CARBON	10 5% 1/4W	
JW2	1-216-295-91	CONDUCTOR, CHIP	(2012)	R51	1-216-091-00 METAL CHIP	56K 5% 1/10W	
JW11	1-216-296-91	CONDUCTOR, CHIP	(3216)	R52	1-216-091-00 METAL CHIP	56K 5% 1/10W	
JW12	1-216-296-91	CONDUCTOR, CHIP	(3216)	R53	1-216-073-00 METAL CHIP	10K 5% 1/10W	
JW13	1-216-296-91	CONDUCTOR, CHIP	(3216)	R54	1-216-309-00 METAL CHIP	5. 6 5% 1/10W	
JW14	1-216-296-91	CONDUCTOR, CHIP	(3216)	R55	1-216-309-00 METAL CHIP	5. 6 5% 1/10W	
JW15	1-216-296-91	CONDUCTOR, CHIP	(3216)	R56	1-216-298-00 METAL CHIP	2. 2 5% 1/10W	
JW16	1-216-296-91	CONDUCTOR, CHIP	(3216)	R71	1-216-082-00 METAL GLAZE	24K 5% 1/10W	
JW17	1-216-296-91	CONDUCTOR, CHIP	(3216)	R72	1-216-081-00 METAL CHIP	22K 5% 1/10W	
JW18	1-216-296-91	CONDUCTOR, CHIP	(3216)	R73	1-216-089-91 METAL GLAZE	47K 5% 1/10W	
JW19	1-216-296-91	CONDUCTOR, CHIP	(3216)	R74	1-216-089-91 METAL GLAZE	47K 5% 1/10W	
JW20	1-216-296-91	CONDUCTOR, CHIP	(3216)	< VARIABLE RESISTOR >			
JW21	1-216-296-91	CONDUCTOR, CHIP	(3216)	RV11	1-241-761-11 RES, ADJ, CARBON 1K		
JW22	1-216-296-91	CONDUCTOR, CHIP	(3216)	RV12	1-238-551-11 RES, ADJ, CARBON 220K		
JW23	1-216-296-91	CONDUCTOR, CHIP	(3216)	RV21	1-241-761-11 RES, ADJ, CARBON 1K		
JW24	1-216-296-91	CONDUCTOR, CHIP	(3216)	RV22	1-238-551-11 RES, ADJ, CARBON 220K		
JW25	1-216-296-91	CONDUCTOR, CHIP	(3216)	RV71	1-241-630-11 RES, ADJ, CARBON 10K		
JW26	1-216-296-91	CONDUCTOR, CHIP	(3216)	RV72	1-241-630-11 RES, ADJ, CARBON 10K		
JW27	1-216-296-91	CONDUCTOR, CHIP	(3216)	< TRANSFORMER >			
< COIL >				T51	1-429-290-11 TRANSFORMER, BIAS OSCILLATION		
L11	1-410-780-11	INDUCTOR	27mH	*****			
L21	1-410-780-11	INDUCTOR	27mH	* 1-638-020-11	LEAF SW-A BOARD		
< TRANSISTOR >				*****			
Q51	8-729-111-29	TRANSISTOR	2SD1616A-K	< CONNECTOR >			
Q52	8-729-111-29	TRANSISTOR	2SD1616A-K	* CNP81	1-568-850-11	SOCKET, CONNECTOR 7P	
Q53	8-729-111-29	TRANSISTOR	2SD1616A-K	< IC >			
Q71	8-729-216-22	TRANSISTOR	2SA1162-G	IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(H1)	
< RESISTOR >							
R11	1-216-099-00	METAL CHIP	120K 5% 1/10W				
R12	1-216-033-00	METAL CHIP	220 5% 1/10W				

LEAF SW-A

LEAF SW-B

TC MAIN

Ref.No.	Part No.	Description	Remark
< RESISTOR >			
R84	1-249-417-11	CARBON 1K 5% 1/4W	
R85	1-249-408-11	CARBON 180 5% 1/4W	
< SWITCH >			
S81	1-571-958-11	SWITCH, PUSH (1 KEY) (STOP DET)	
S82	1-571-281-21	SWITCH, LEAF (CrO2 DET)	
S86	1-571-281-21	SWITCH, LEAF (HALF DET)	

*	1-638-020-11	LEAF SW-B BOARD	

< CONNECTOR >			
* CNP81	1-568-850-11	SOCKET, CONNECTOR 7P	
< IC >			
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(H1)	
< RESISTOR >			
R81	1-249-414-11	CARBON 560 5% 1/4W	
R82	1-247-818-11	CARBON 300 5% 1/4W	
R83	1-247-834-11	CARBON 1.3K 5% 1/4W	
R84	1-249-417-11	CARBON 1K 5% 1/4W	
R85	1-249-408-11	CARBON 180 5% 1/4W	
< SWITCH >			
S81	1-571-958-11	SWITCH, PUSH (1 KEY) (STOP DET)	
S82	1-571-281-21	SWITCH, LEAF (CrO2 DET)	
S83	1-571-281-21	SWITCH, LEAF (METAL DET)	
S84	1-571-281-21	SWITCH, LEAF (ERASE PROOF (A))	
S85	1-571-281-21	SWITCH, LEAF (ERASE PROOF (B))	
S86	1-571-281-21	SWITCH, LEAF (HALF DET)	

*	A-2007-477-A	TC MAIN BOARD, COMPLETE	

	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
< CAPACITOR >			
C102	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C103	1-162-282-31	CERAMIC 100PF 10% 50V	
C104	1-130-475-00	MYLAR 0.0022uF 5% 50V	
C105	1-130-475-00	MYLAR 0.0022uF 5% 50V	
C106	1-126-961-11	ELECT 2.2uF 20% 50V	
C107	1-136-174-00	FILM 0.56uF 5% 50V	
C108	1-136-171-00	FILM 0.33uF 5% 50V	
C109	1-126-961-11	ELECT 2.2uF 20% 50V	

Ref.No.	Part No.	Description	Remark
C110	1-126-961-11	ELECT 2.2uF 20% 50V	
C111	1-162-282-31	CERAMIC 100PF 10% 50V	
C114	1-124-907-11	ELECT 10uF 20% 50V	
C115	1-124-443-00	ELECT 100uF 20% 10V	
C116	1-162-282-31	CERAMIC 100PF 10% 50V	
C119	1-124-902-00	ELECT 0.47uF 20% 50V	
C120	1-126-963-11	ELECT 4.7uF 20% 50V	
C130	1-162-282-31	CERAMIC 100PF 10% 50V	
C131	1-162-282-31	CERAMIC 100PF 10% 50V	
C132	1-124-903-11	ELECT 1uF 20% 50V	
C133	1-162-286-31	CERAMIC 220PF 10% 50V	
C202	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C203	1-162-282-31	CERAMIC 100PF 10% 50V	
C204	1-130-475-00	MYLAR 0.0022uF 5% 50V	
C205	1-130-475-00	MYLAR 0.0022uF 5% 50V	
C206	1-126-961-11	ELECT 2.2uF 20% 50V	
C207	1-136-174-00	FILM 0.56uF 5% 50V	
C208	1-136-171-00	FILM 0.33uF 5% 50V	
C209	1-126-961-11	ELECT 2.2uF 20% 50V	
C210	1-126-961-11	ELECT 2.2uF 20% 50V	
C211	1-162-282-31	CERAMIC 100PF 10% 50V	
C214	1-124-907-11	ELECT 10uF 20% 50V	
C215	1-124-443-00	ELECT 100uF 20% 10V	
C216	1-162-282-31	CERAMIC 100PF 10% 50V	
C219	1-124-902-00	ELECT 0.47uF 20% 50V	
C220	1-126-963-11	ELECT 4.7uF 20% 50V	
C230	1-162-282-31	CERAMIC 100PF 10% 50V	
C231	1-162-282-31	CERAMIC 100PF 10% 50V	
C232	1-124-903-11	ELECT 1uF 20% 50V	
C233	1-162-286-31	CERAMIC 220PF 10% 50V	
C502	1-126-944-11	ELECT 3300uF 20% 16V	
C504	1-126-944-11	ELECT 3300uF 20% 16V	
C518	1-124-907-11	ELECT 10uF 20% 50V	
C519	1-124-907-11	ELECT 10uF 20% 50V	
C529	1-136-157-00	FILM 0.022uF 5% 50V	
C530	1-136-157-00	FILM 0.022uF 5% 50V	
C533	1-136-157-00	FILM 0.022uF 5% 50V	
C534	1-136-157-00	FILM 0.022uF 5% 50V	
C535	1-126-942-61	ELECT 1000uF 20% 16V	
C536	1-126-942-61	ELECT 1000uF 20% 16V	
C537	1-124-472-11	ELECT 470uF 20% 10V	
C538	1-124-472-11	ELECT 470uF 20% 10V	
C540	1-126-926-11	ELECT 1000uF 20% 10V	
C601	1-124-443-00	ELECT 100uF 20% 10V	
C602	1-164-159-11	CERAMIC 0.1uF 50V	
C603	1-162-282-31	CERAMIC 100PF 10% 50V	
C604	1-164-159-11	CERAMIC 0.1uF 50V	
C606	1-124-480-11	ELECT 470uF 20% 25V	
C607	1-124-480-11	ELECT 470uF 20% 25V	
C608	1-124-480-11	ELECT 470uF 20% 25V	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C609	1-124-902-00	ELECT	0. 47uF 20% 50V	D603	8-719-987-63	DIODE 1N4148M	
C610	1-124-472-11	ELECT	470uF 20% 10V	D604	8-719-987-63	DIODE 1N4148M	
C611	1-162-290-31	CERAMIC	470PF 10% 50V	D605	8-719-024-99	DIODE 11ES2-NTA2B	
C612	1-124-472-11	ELECT	470uF 20% 10V	D606	8-719-024-99	DIODE 11ES2-NTA2B	
C613	1-162-290-31	CERAMIC	470PF 10% 50V	D607	8-719-987-63	DIODE 1N4148M	
C614	1-164-159-11	CERAMIC	0. 1uF 50V	D608	8-719-987-63	DIODE 1N4148M	
C615	1-164-159-11	CERAMIC	0. 1uF 50V	D610	8-719-024-99	DIODE 11ES2-NTA2B	
C616	1-124-910-11	ELECT	47uF 20% 50V	D611	8-719-987-63	DIODE 1N4148M	
C617	1-164-159-11	CERAMIC	0. 1uF 50V	D620	8-719-012-68	DIODE UZ-2. 7BSA-TP	
C620	1-124-907-11	ELECT	10uF 20% 50V	< IC >			
C621	1-124-907-11	ELECT	10uF 20% 50V	IC101	8-752-058-57	IC CXA1599Q	
C622	1-124-477-11	ELECT	47uF 20% 25V	IC102	8-759-939-73	IC BA3308	
C623	1-124-477-11	ELECT	47uF 20% 25V	IC103	8-752-059-55	IC CXA1331S	
C630	1-126-963-11	ELECT	4. 7uF 20% 50V	IC104	8-759-337-73	IC M38123M4-118FP	
C631	1-124-903-11	ELECT	1uF 20% 50V	IC502	8-759-231-53	IC TA7805S	
C636	1-126-965-11	ELECT	22uF 20% 50V	IC503	8-759-604-86	IC M5F7807L	
C641	1-126-963-11	ELECT	4. 7uF 20% 50V	IC504	8-759-604-90	IC M5F7907L	
C642	1-124-902-00	ELECT	0. 47uF 20% 50V	IC505	8-759-604-86	IC M5F7807L	
C645	1-124-907-11	ELECT	10uF 20% 50V	IC506	8-759-604-90	IC M5F7907L	
C646	1-126-961-11	ELECT	2. 2uF 20% 50V	IC602	8-759-256-72	IC PST994D	
C649	1-124-907-11	ELECT	10uF 20% 50V	IC603	8-759-266-35	IC TA8242AK	
C650	1-126-965-11	ELECT	22uF 20% 50V	IC6004	8-759-000-48	IC MC14052BCP	
C651	1-124-443-00	ELECT	100uF 20% 10V	< COIL >			
C800	1-162-286-31	CERAMIC	220PF 10% 50V	L601	1-414-189-31	INDUCTOR 100uH	
C6035	1-162-294-31	CERAMIC	0. 001uF 10% 50V	L6002	1-414-183-41	INDUCTOR 10uH	
< CONNECTOR >				< JACK >			
CN601	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P		PJ101	1-695-188-31	JACK, PIN 4P (TAPE IN/OUT)	
* CN602	1-691-916-11	CONNECTOR, BOARD TO BOARD		< TRANSISTOR >			
CN603	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P		Q101	8-729-119-78	TRANSISTOR 2SC2785-HFE	
* CN604	1-691-916-11	CONNECTOR, BOARD TO BOARD		Q122	8-729-900-89	TRANSISTOR DTC144ES	
* CN605	1-691-916-11	CONNECTOR, BOARD TO BOARD		Q201	8-729-119-78	TRANSISTOR 2SC2785-HFE	
CN608	1-770-166-11	CONNECTOR, FFC/FPC 17P		Q222	8-729-900-89	TRANSISTOR DTC144ES	
CN609	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)		Q603	8-729-801-93	TRANSISTOR 2SD1387	
< DIODE >				Q604	8-729-801-93	TRANSISTOR 2SD1387	
D508	8-719-024-99	DIODE 11ES2-NTA2B		Q605	8-729-900-80	TRANSISTOR DTC114ES	
D509	8-719-024-99	DIODE 11ES2-NTA2B		Q607	8-729-900-89	TRANSISTOR DTC144ES	
D510	8-719-024-99	DIODE 11ES2-NTA2B		Q608	8-729-900-89	TRANSISTOR DTC144ES	
D511	8-719-024-99	DIODE 11ES2-NTA2B		Q609	8-729-900-89	TRANSISTOR DTC144ES	
D512	8-719-024-99	DIODE 11ES2-NTA2B		Q611	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D513	8-719-024-99	DIODE 11ES2-NTA2B		Q612	8-729-119-76	TRANSISTOR 2SA1175-HFE	
D519	8-719-024-99	DIODE 11ES2-NTA2B		Q613	8-729-900-65	TRANSISTOR DTA144ES	
D522	8-719-024-99	DIODE 11ES2-NTA2B		Q614	8-729-900-89	TRANSISTOR DTC144ES	
D523	8-719-987-63	DIODE 1N4148M		Q620	8-729-900-89	TRANSISTOR DTC144ES	
D524	8-719-987-63	DIODE 1N4148M		Q621	8-729-900-65	TRANSISTOR DTA144ES	
D525	8-719-024-99	DIODE 11ES2-NTA2B		Q627	8-729-900-89	TRANSISTOR DTC144ES	
D526	8-719-024-99	DIODE 11ES2-NTA2B					
D601	8-719-987-63	DIODE 1N4148M					
D602	8-719-987-63	DIODE 1N4148M					

TC MAIN

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
Q630	8-729-422-57	TRANSISTOR UN4111		△R621	1-212-853-00	FUSIBLE 6.8 5% 1/4W F	
Q802	8-729-900-80	TRANSISTOR DTC114ES		R622	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q803	8-729-900-80	TRANSISTOR DTC114ES					
Q804	8-729-900-80	TRANSISTOR DTC114ES		R623	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q805	8-729-900-80	TRANSISTOR DTC114ES		R624	1-249-434-11	CARBON 27K 5% 1/4W	
< RESISTOR >				R625	1-249-421-11	CARBON 2.2K 5% 1/4W	
R106	1-249-418-11	CARBON 1.2K 5% 1/4W		R626	1-249-421-11	CARBON 2.2K 5% 1/4W	
R107	1-247-864-11	CARBON 24K 5% 1/4W		R627	1-249-421-11	CARBON 2.2K 5% 1/4W	
R108	1-249-414-11	CARBON 560 5% 1/4W		R628	1-249-434-11	CARBON 27K 5% 1/4W	
R109	1-249-429-11	CARBON 10K 5% 1/4W		R629	1-249-421-11	CARBON 2.2K 5% 1/4W	
R110	1-249-427-11	CARBON 6.8K 5% 1/4W		R630	1-249-429-11	CARBON 10K 5% 1/4W	
R111	1-249-427-11	CARBON 6.8K 5% 1/4W		R631	1-249-421-11	CARBON 2.2K 5% 1/4W	
R112	1-247-832-11	CARBON 1.1K 5% 1/4W		R632	1-249-429-11	CARBON 10K 5% 1/4W	
R113	1-249-429-11	CARBON 10K 5% 1/4W		R633	1-247-807-31	CARBON 100 5% 1/4W	
R114	1-249-421-11	CARBON 2.2K 5% 1/4W		R634	1-247-807-31	CARBON 100 5% 1/4W	
R115	1-247-887-00	CARBON 220K 5% 1/4W		R637	1-249-414-11	CARBON 560 5% 1/4W	
R116	1-249-437-11	CARBON 47K 5% 1/4W		R640	1-249-429-11	CARBON 10K 5% 1/4W	
R117	1-249-419-11	CARBON 1.5K 5% 1/4W		R641	1-247-807-31	CARBON 100 5% 1/4W	
R118	1-249-438-11	CARBON 56K 5% 1/4W		R642	1-249-424-11	CARBON 3.9K 5% 1/4W	
R119	1-247-834-11	CARBON 1.3K 5% 1/4W		R648	1-249-437-11	CARBON 47K 5% 1/4W	
R120	1-247-807-31	CARBON 100 5% 1/4W		R649	1-249-437-11	CARBON 47K 5% 1/4W	
R121	1-247-807-31	CARBON 100 5% 1/4W		R650	1-249-437-11	CARBON 47K 5% 1/4W	
R122	1-249-426-11	CARBON 5.6K 5% 1/4W		R656	1-249-393-11	CARBON 10 5% 1/4W	
R206	1-249-418-11	CARBON 1.2K 5% 1/4W		R660	1-249-417-11	CARBON 1K 5% 1/4W	
R207	1-247-864-11	CARBON 24K 5% 1/4W		R661	1-249-434-11	CARBON 27K 5% 1/4W	
R208	1-249-414-11	CARBON 560 5% 1/4W		R670	1-249-433-11	CARBON 22K 5% 1/4W	
R209	1-249-429-11	CARBON 10K 5% 1/4W		R673	1-249-429-11	CARBON 10K 5% 1/4W	
R210	1-249-427-11	CARBON 6.8K 5% 1/4W		R674	1-247-860-11	CARBON 16K 5% 1/4W	
R211	1-249-427-11	CARBON 6.8K 5% 1/4W		R675	1-249-429-11	CARBON 10K 5% 1/4W	
R212	1-247-832-11	CARBON 1.1K 5% 1/4W		R676	1-249-434-11	CARBON 27K 5% 1/4W	
R213	1-249-429-11	CARBON 10K 5% 1/4W		R677	1-247-807-31	CARBON 100 5% 1/4W	
R214	1-249-421-11	CARBON 2.2K 5% 1/4W		R678	1-247-807-31	CARBON 100 5% 1/4W	
R215	1-247-887-00	CARBON 220K 5% 1/4W		R679	1-247-807-31	CARBON 100 5% 1/4W	
R216	1-249-437-11	CARBON 47K 5% 1/4W		R680	1-249-433-11	CARBON 22K 5% 1/4W	
R217	1-249-419-11	CARBON 1.5K 5% 1/4W		R681	1-249-429-11	CARBON 10K 5% 1/4W	
R218	1-249-438-11	CARBON 56K 5% 1/4W		R682	1-249-429-11	CARBON 10K 5% 1/4W	
R219	1-247-834-11	CARBON 1.3K 5% 1/4W		R683	1-249-429-11	CARBON 10K 5% 1/4W	
R220	1-247-807-31	CARBON 100 5% 1/4W		R684	1-249-413-11	CARBON 470 5% 1/4W	
R221	1-247-807-31	CARBON 100 5% 1/4W		R685	1-249-429-11	CARBON 10K 5% 1/4W	
R222	1-249-426-11	CARBON 5.6K 5% 1/4W		R686	1-249-429-11	CARBON 10K 5% 1/4W	
R504	1-247-807-31	CARBON 100 5% 1/4W		R687	1-249-417-11	CARBON 1K 5% 1/4W	
R505	1-249-429-11	CARBON 10K 5% 1/4W		R689	1-247-872-11	CARBON 51K 5% 1/4W	
R601	1-247-807-31	CARBON 100 5% 1/4W		R690	1-249-429-11	CARBON 10K 5% 1/4W	
R602	1-247-807-31	CARBON 100 5% 1/4W		R691	1-249-429-11	CARBON 10K 5% 1/4W	
R606	1-249-435-11	CARBON 33K 5% 1/4W		R693	1-249-433-11	CARBON 22K 5% 1/4W	
R607	1-247-807-31	CARBON 100 5% 1/4W		R694	1-249-433-11	CARBON 22K 5% 1/4W	
R615	1-247-807-31	CARBON 100 5% 1/4W		R695	1-249-421-11	CARBON 2.2K 5% 1/4W	
R616	1-249-433-11	CARBON 22K 5% 1/4W		R696	1-249-421-11	CARBON 2.2K 5% 1/4W	
R620	1-249-429-11	CARBON 10K 5% 1/4W		R700	1-247-903-00	CARBON 1M 5% 1/4W	
				R701	1-249-429-11	CARBON 10K 5% 1/4W	
				R702	1-249-437-11	CARBON 47K 5% 1/4W	

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R801	1-249-429-11	CARBON	10K 5% 1/4W	< RESISTOR >			
R802	1-247-807-31	CARBON	100 5% 1/4W	R900	1-249-418-11	CARBON	1.2K 5% 1/4W
R803	1-247-807-31	CARBON	100 5% 1/4W	R901	1-249-420-11	CARBON	1.8K 5% 1/4W
R804	1-247-807-31	CARBON	100 5% 1/4W	R902	1-249-422-11	CARBON	2.7K 5% 1/4W
R805	1-247-807-31	CARBON	100 5% 1/4W	R903	1-249-424-11	CARBON	3.9K 5% 1/4W
R807	1-249-433-11	CARBON	22K 5% 1/4W	R904	1-249-427-11	CARBON	6.8K 5% 1/4W
R808	1-249-429-11	CARBON	10K 5% 1/4W	R905	1-249-418-11	CARBON	1.2K 5% 1/4W
R809	1-249-429-11	CARBON	10K 5% 1/4W	R906	1-249-420-11	CARBON	1.8K 5% 1/4W
R810	1-249-429-11	CARBON	10K 5% 1/4W	R907	1-249-422-11	CARBON	2.7K 5% 1/4W
R813	1-249-411-11	CARBON	330 5% 1/4W	R908	1-249-424-11	CARBON	3.9K 5% 1/4W
R814	1-249-411-11	CARBON	330 5% 1/4W	R909	1-249-427-11	CARBON	6.8K 5% 1/4W
R815	1-249-411-11	CARBON	330 5% 1/4W	R910	1-249-431-11	CARBON	15K 5% 1/4W
R816	1-249-411-11	CARBON	330 5% 1/4W	R911	1-249-437-11	CARBON	47K 5% 1/4W
R817	1-249-411-11	CARBON	330 5% 1/4W	R914	1-249-426-11	CARBON	5.6K 5% 1/4W
R818	1-249-435-11	CARBON	33K 5% 1/4W	R915	1-249-434-11	CARBON	27K 5% 1/4W
R819	1-249-393-11	CARBON	10 5% 1/4W	R916	1-249-425-11	CARBON	4.7K 5% 1/4W
R820	1-249-417-11	CARBON	1K 5% 1/4W	< SWITCH >			
R821	1-249-417-11	CARBON	1K 5% 1/4W	S900	1-762-205-11	SWITCH, SLIDE (DIRECTION MODE)	
R822	1-249-417-11	CARBON	1K 5% 1/4W	S901	1-762-205-11	SWITCH, SLIDE (DOLBY NR)	
R823	1-249-425-11	CARBON	4.7K 5% 1/4W	S902	1-554-303-21	SWITCH, TACTILE (■ DECK B)	
R6070	1-249-421-11	CARBON	2.2K 5% 1/4W	S903	1-554-303-21	SWITCH, TACTILE (▷ DECK B)	
R6071	1-249-421-11	CARBON	2.2K 5% 1/4W	S904	1-554-303-21	SWITCH, TACTILE (◁ DECK B)	
< VARIABLE RESISTOR >				S905	1-554-303-21	SWITCH, TACTILE (■ PAUSE, DECK B)	
RV101	1-238-600-11	RES, ADJ, CARBON 10K		S906	1-554-303-21	SWITCH, TACTILE (◀ DECK A)	
RV201	1-238-600-11	RES, ADJ, CARBON 10K		S907	1-554-303-21	SWITCH, TACTILE (▶ DECK A)	
< VIBRATOR >				S908	1-554-303-21	SWITCH, TACTILE (■ DECK A)	
X601	1-577-358-21	VIBRATOR, CERAMIC (4MHz)		S909	1-554-303-21	SWITCH, TACTILE (▷ DECK A)	
*****				S910	1-554-303-21	SWITCH, TACTILE (◁ DECK A)	
* A-2007-478-A TC PANEL BOARD, COMPLETE				S911	1-554-303-21	SWITCH, TACTILE (◀ DECK B)	
*****				S912	1-554-303-21	SWITCH, TACTILE (▶ DECK B)	
< CONNECTOR >				S913	1-554-303-21	SWITCH, TACTILE (● REC)	
CN900	1-770-169-11	CONNECTOR, FFC/FPC 17P		S915	1-554-303-21	SWITCH, TACTILE (DUBBING MODE)	
< DIODE >				S916	1-554-303-21	SWITCH, TACTILE (CD SYNC)	
D900	8-719-046-43	DIODE SEL5421E-TP15 (▷ DECK A)		S917	1-554-303-21	SWITCH, TACTILE (● REC MUTE)	
D901	8-719-046-43	DIODE SEL5421E-TP15 (◁ DECK A)		*****			
D902	8-719-046-43	DIODE SEL5421E-TP15 (▷ DECK B)		MISCELLANEOUS			
D903	8-719-046-43	DIODE SEL5421E-TP15 (◁ DECK B)		*****			
D906	8-719-046-44	DIODE SEL5221S (CD SYNC)		58	1-769-390-11	WIRE (FLAT TYPE) (17 CORE)	
D907	8-719-046-44	DIODE SEL5221S (HIGH)		73	1-765-384-11	WIRE (FLAT TYPE) (7 CORE)	
D908	8-719-046-44	DIODE SEL5221S (NORMAL)		HP1	A-2003-757-A	BASE ASSY, HEAD (PB) (DECK A)	
D909	8-719-046-36	DIODE SEL5921A-TP15 (■)		HRPE1	A-2003-930-A	BASE ASSY, HEAD (PB/REC/ERASE) (DECK A)	
D910	8-719-046-44	DIODE SEL5221S (REC)		IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(HI)	
				M1	X-3363-501-2	MOTOR ASSY (REEL)	
				M2	X-3365-377-2	MOTOR ASSY (CAPSTAN)	

TC-EX90/EX100

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
ACCESSORIES & PACKING MATERIALS			

*	3-933-134-01	CUSHION (LOWER)	
*	3-933-164-01	CUSHION (UPPER)	

HARDWARE LIST			

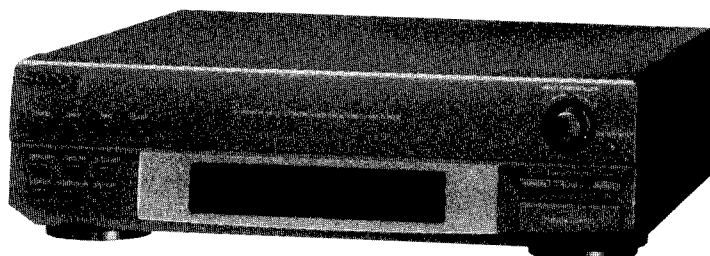
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#2	7-621-770-67	SCREW +BVTT 2.6X6 (S)	
#3	7-621-775-00	SCREW +B 2.6X3	
#4	7-627-556-08	SCREW +P 2.6X2.8	
#5	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	

MC-Service

ST-EX100

SERVICE MANUAL

*AEP Model
UK Model
E Model*



This set is the tuner section in
MHC-EX50/EX70AV/EX90/
EX100AV.

Photo : E mode (SILVER)

SPECIFICATIONS

FM stereo, FM/AM superheterodyne tuner

FM tuner section

Tuning range 87.5 – 108.0 MHz
(50 kHz step)
Aerial FM lead aerial
Aerial terminals 75 ohm unbalanced
Intermediate frequency 10.7 MHz

AM tuner section

Tuning range
Italian model:
AM: 522 – 1,611 kHz
(with the interval set at 9 kHz)
German model:
AM: 531 – 1,602 kHz
(with the interval set at 9 kHz)
E, Saudi Arabia, Thailand models:
AM: 531 – 1,602 kHz
(with the interval set at 9 kHz)
530 – 1,710 kHz
(with the interval set at 10 kHz)

Other models:

MW: 531 – 1,602 kHz
(with the interval set at 9 kHz)

LW: 153 – 279 kHz
(with the interval set at 3 kHz)

Aerial AM loop aerial,
External aerial terminals

Intermediate frequency 450 kHz

Dimensions
Approx. 280 x 82.5 x 285 mm
(11 1/8 x 3 1/4 x 11 1/4 in) (w/h/d)
incl. projecting parts and controls

Mass
Approx. 1.5 kg
(3 lb 4 oz)



FM STEREO/FM-AM TIMER TUNER
SONY®

MODEL IDENTIFICATION

— Back Panel —



4-978-999-0□...E model
 4-978-999-1□...AEP, UK, German, Italian, CIS model
 (Made in France)
 4-978-999-2□...AEP, UK model (Made in Malaysia)
 4-978-999-3□...Saudi Arabia model
 4-978-999-4□...Thailand model

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	• IC201 System Control (μPD78013GC)	17
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SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK Δ OR DOTTED LINE WITH MARK Δ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1

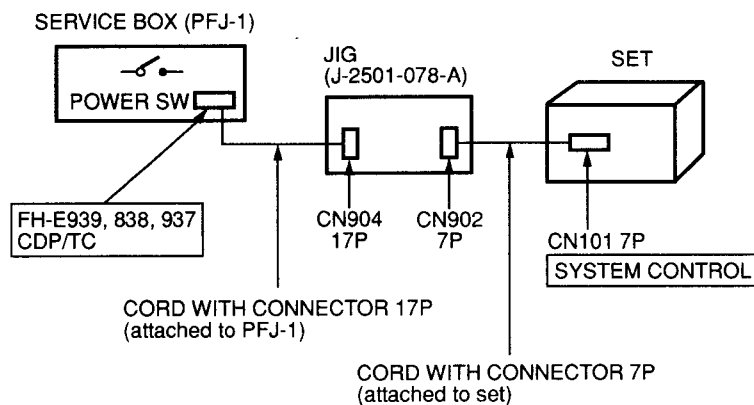
SERVICING NOTE

How to operate with a single unit.

Normally, this set is not operated with its own.

The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.

Turn the power set of the service box ON. Then press the ENTER/NEXT button and SLEEP button at the same time to turn the power on.



• KEY/FL tube/LED check mode.

To enter KEY/FL/LED check mode, press the ENTER/NEXT and REC buttons at the same time.

Under mode, every time when press any key or turn MULTI CONTROLLER knob, change to next situation.

- ① All LED indicators light on
- ② All FL tube indicators light on
- ③ A part of FL tube light on mode 1. (Indicated ST-SEG)
- ④ A part of FL tube light on mode 2. (Indicated RDS-SEG)
- ⑤ KEY check mode

Note :

- 1) All LED light on mode is kepted, when buttons which is pressed to enter all LED light on mode, release same time. When release them separate timing, it is moved to next All LED light on mode.
- 2) After all LED light on mode, light on point remove one by one, when any button pressed or MULTI CONTROLLER knob turned.
- 3) Under KEY check mode, every time buttons pressed numerical value of "KEY" in FL tube increase. And that time, numerical value of "ECDR" increase when MULTI CONTROLLER button turn to + direction, and it decrease turn to - direction.

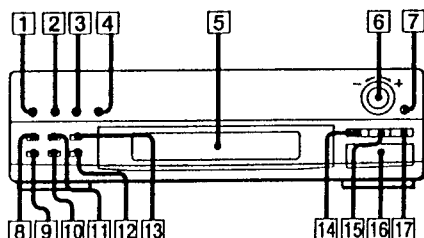
When you want to finish this mode, unplug the power of amplifire or turn off PFJ-1 of POWER switch.

SECTION 2 GENERAL

This section is extracted
from instruction manual.

Index to Parts and Controls

Front Panel

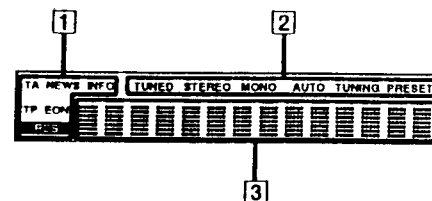


- 1 ONCE button* (25, 26)
- 2 DAILY button* (25, 26)
- 3 REC button* (26)
- 4 SLEEP button* (25)
- 5 Display window (6, 10, 25)
- 6 MULTI CONTROLLER*
(6, 10, 11, 13, 26)
- 7 ENTER/NEXT button* (6, 11, 26)
- 8 CHARACTER button (11)
- 9 EON (Enhanced Other Networks)
button (12) (AEP, UK, G, IT)
MEMORY button (E, EA, CIS, TH)
- 10 PTY (Programme Type) button (13)
(AEP, G, IT, UK)
STEREO/MONO button
(E, EA, CIS, TH)
- 11 TIMER SET button (25)
- 12 DISPLAY button (11, 12)
- 13 CLOCK SET button (6)
- 14 STEREO/MONO button (10)
MANUAL button (E, EA, CIS, TH)
- 15 TUNING MODE button (10)
(AEP, UK, G, IT)
AUTO button
(E, EA, CIS, TH)
- 16 TUNER/BAND button (10, 18, 30)
- 17 MEMORY button (11)
(AEP, UK, G, IT)
PRESET button (E, EA, CIS, TH)

• Abbreviation

- G : German model.
- IT : Italian model.
- EA : Saudi Arabia model.
- TH : Thailand model

Display Window

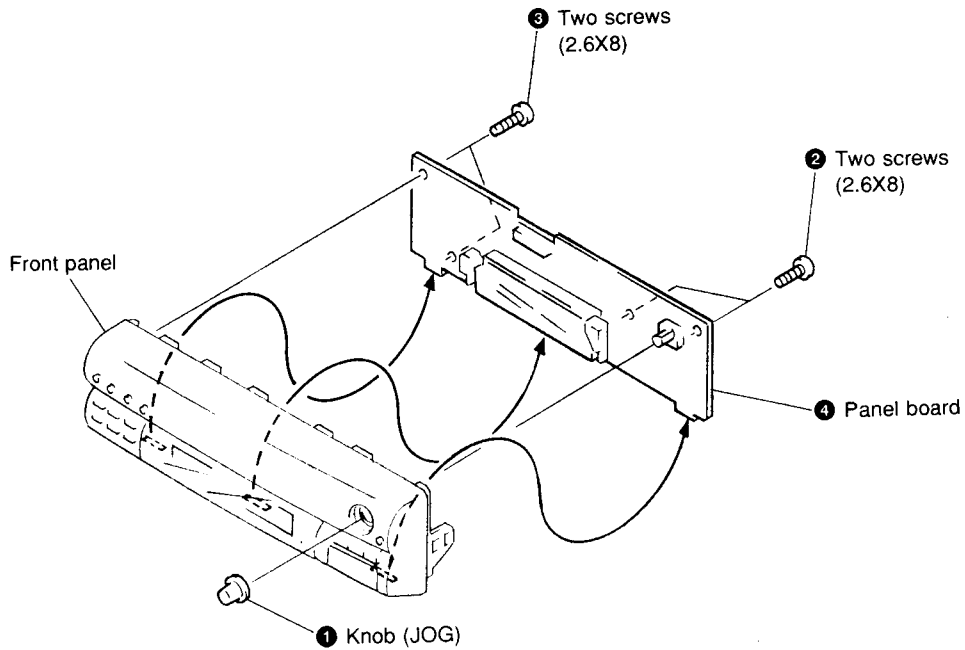


- 1 RDS service indications (12) (AEP, UK, G, IT)
- 2 Tuner indication (10)
- 3 Frequency/station name/time/timer
indication (6, 10, 11, 25)

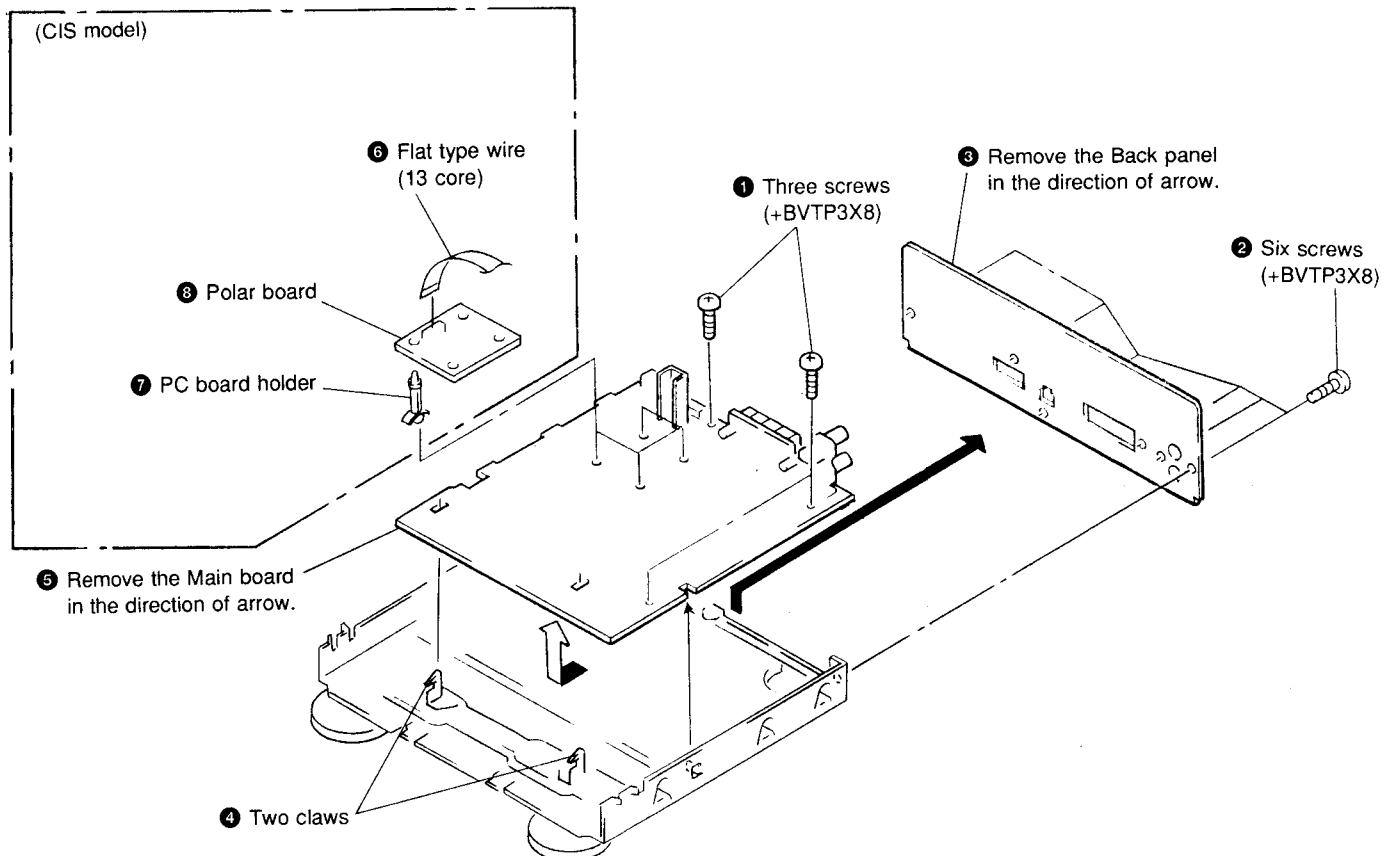
SECTION 3 DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

3-1. PANEL BOARD



3-2. BACK PANEL, MAIN BOARD AND POLAR BOARD



MC-Service

SECTION 4

ELECTRICAL ADJUSTMENTS

Precautions in Repairing

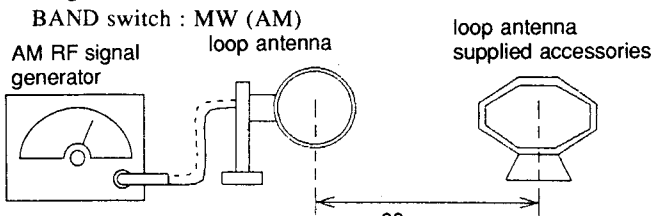
If the front unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

The FM TUNED level must be adjusted after the AM TUNED level adjustment has completed.

AM SECTION

AM Tuning Level Adjustment

Setting :



30% amplitude modulation by 400Hz signal
 field strength dB ($\mu\text{V}/\text{m}$) = RF SSG output level dB ($\mu\text{V}/\text{m}$) - 26dB.

Carrier frequency : 999kHz (at 9k step)
 1,000kHz (at 10k step)

Output level : 25dB μ

Procedure :

1. Set loop antenna A so that the loop antenna B input level becomes 55dB μ /m.
2. Tune the set to 999kHz or 1,000 kHz.
3. Adjust RV1 so that the TUNED indicator goes on.

Adjustment Location : MAIN board. (See page 7)

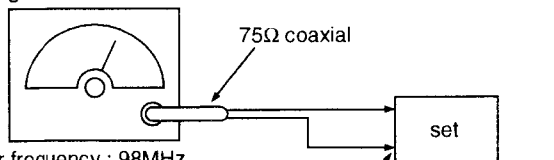
FM SECTION

FM Tuning Level Adjustment

Setting :

BAND switch : FM

FM RF signal generator



Carrier frequency : 98MHz

Modulation : AUDIO 1kHz, 75kHz deviation (100%)

Output level : 26dB μ (17.8 μV)

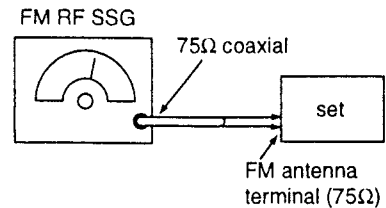
Procedure :

1. Tune the set to 98MHz.
2. Adjust RV2 so that the TUNED indicator goes on.

Adjustment Location : MAIN board. (See page 7)

FM Polar Adjustment (CIS model only)

Connection 1 :

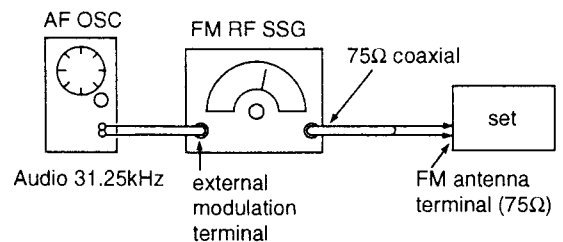


Carrier frequency : 69MHz

Output level : 1mV (60dB μ) (at 75Ω open)

Modulation : AUDIO 1kHz, 10kHz deviation

Connection 2 :



Carrier frequency : 69MHz

Output level : 1mV (60dB μ) (at 75Ω open)

Modulation : AUDIO 31.25kHz, 10kHz deviation (EXTERNAL MODULATION)

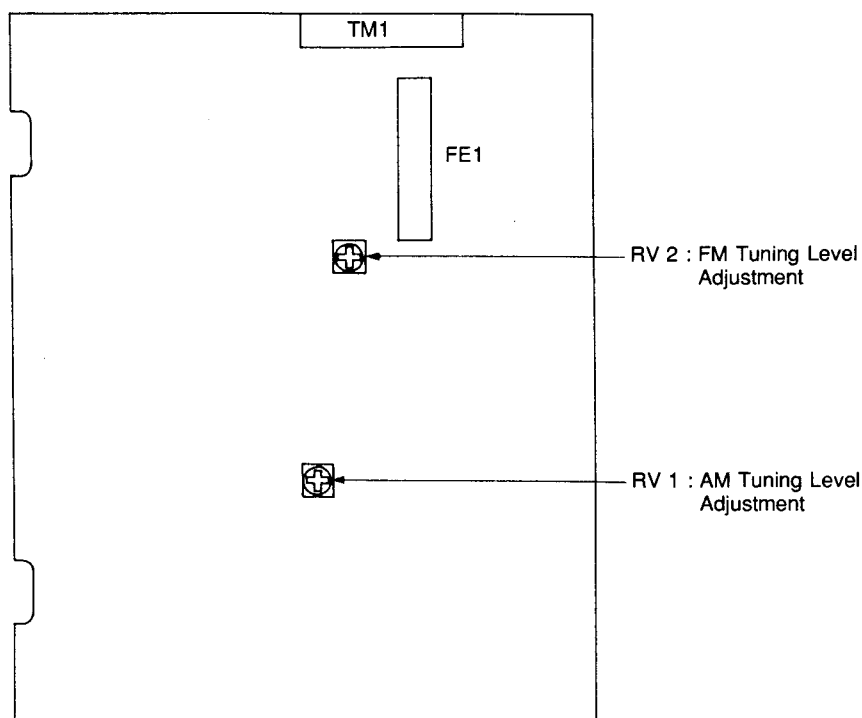
Procedure :

1. Set the modulation of FM RF SSG to AUDIO 1 kHz, 10 kHz deviation according to "Connection 1".
2. Tune the set to 69 MHz.
3. Adjust the RV1702 so that the reading of frequency counter connected to TP1702 becomes within 31.25 kHz \pm 0.05 kHz. (VCO frequency adjustment)
4. Then record the reading of the level meter connected to TP1701.
5. Set the modulation of FM RF SSG to AUDIO 31.25 kHz, 10 kHz deviation according to "Connection 2".
6. Tune the set to 69 MHz.
7. Set the CT1701 to be mechanical center.
8. Adjust the L1701 so that the reading of the level meter connected to TP1701 becomes maximum. Then adjust the CT1701 so that the reading of the level meter connected to TP1701 becomes maximum. (SUB CARRIER PEAK Adjustment)
9. Adjust the RV1701 so that the level at the moment becomes 14 dB higher value than the level recorded in step 4. (SUB CARRIER LEVEL Adjustment)

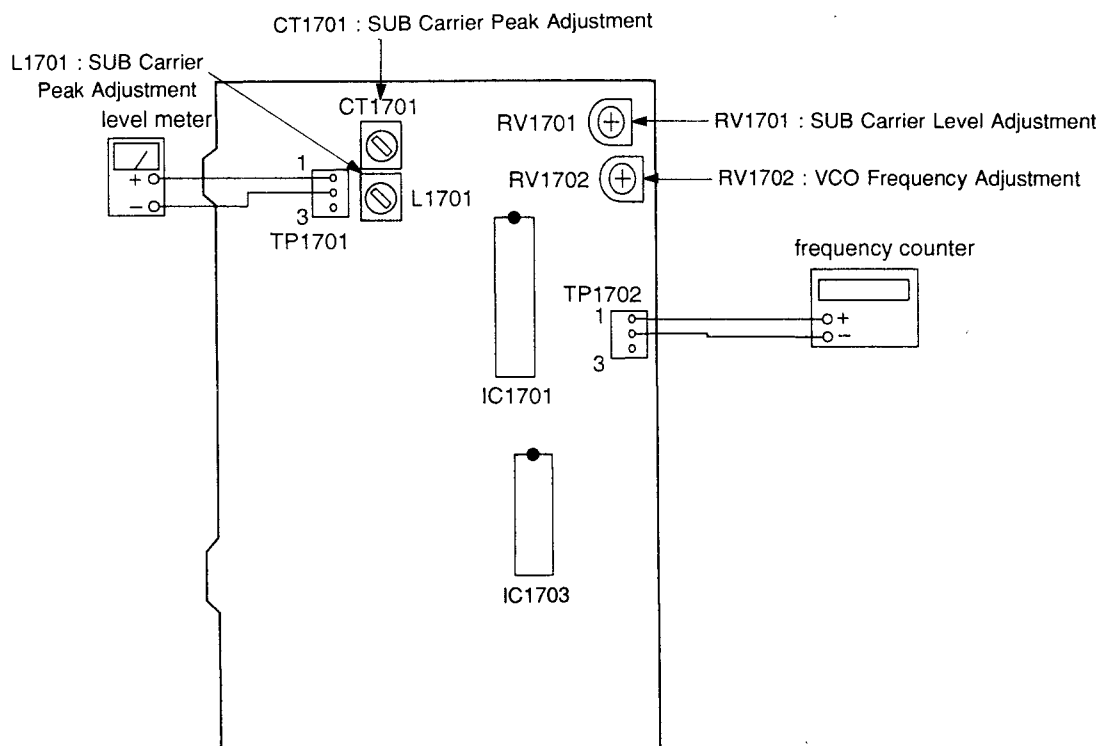
Adjustment Location : Polar board. (See page 7)

Adjustment Location

[MAIN BOARD] — Component side —



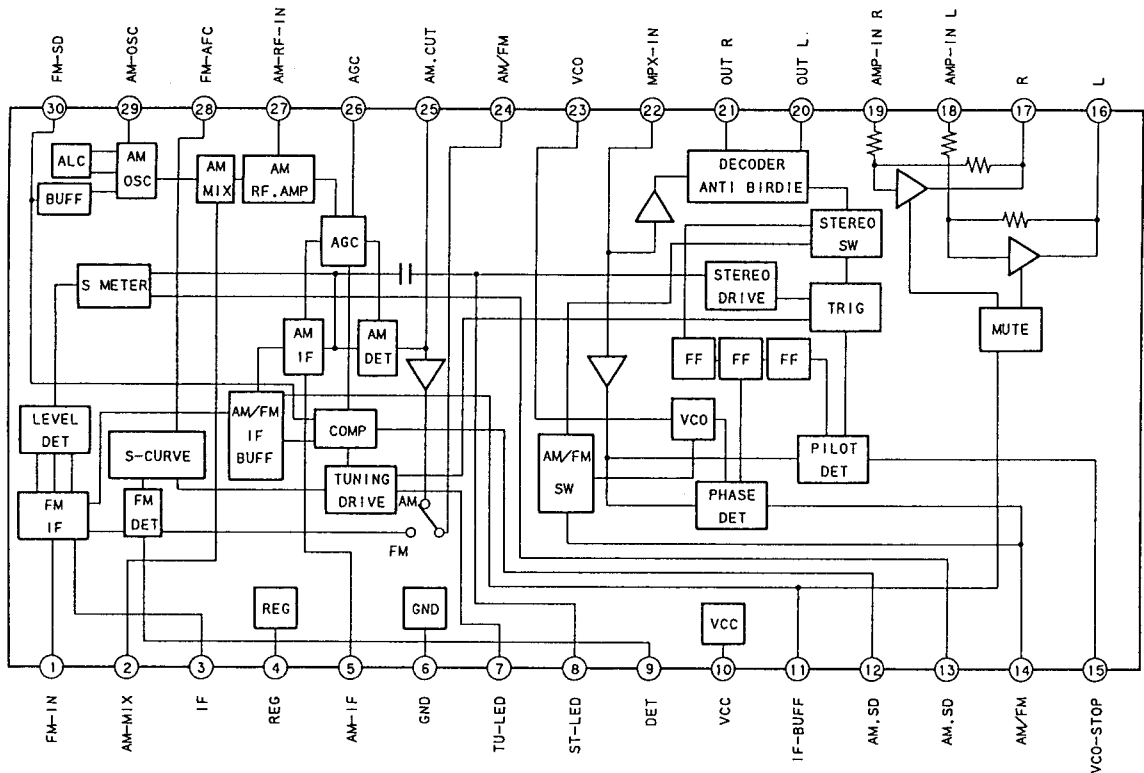
[POLAR BOARD] — Component side —



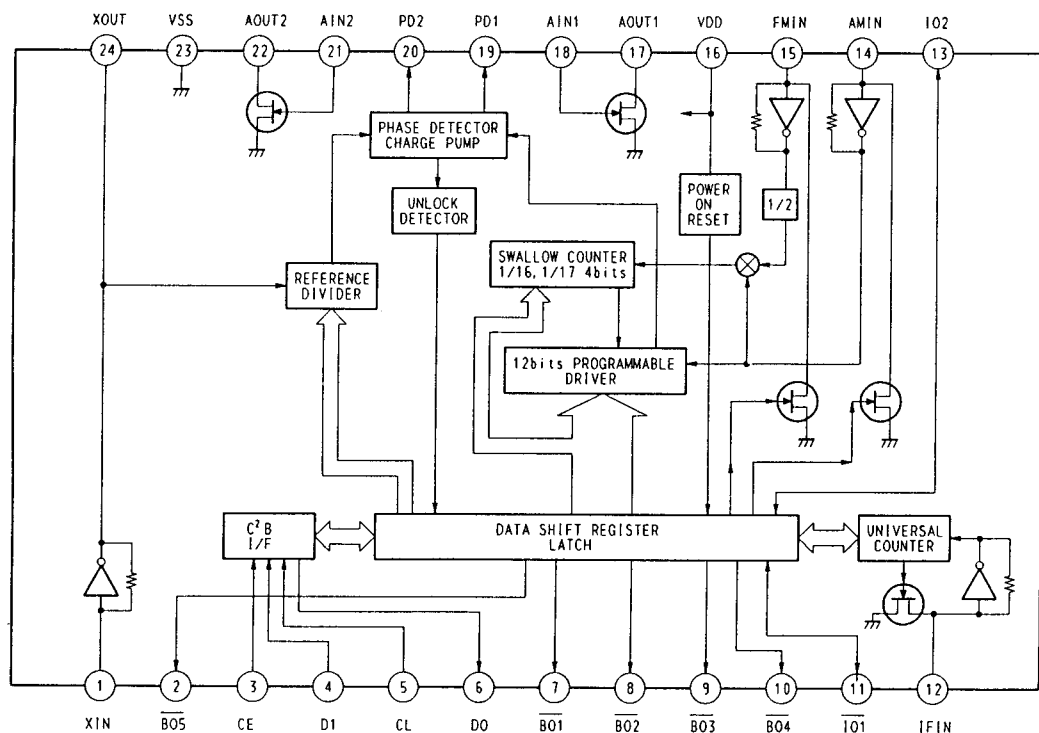
SECTION 5 DIAGRAMS

5-1. IC BLOCK DIAGRAMS

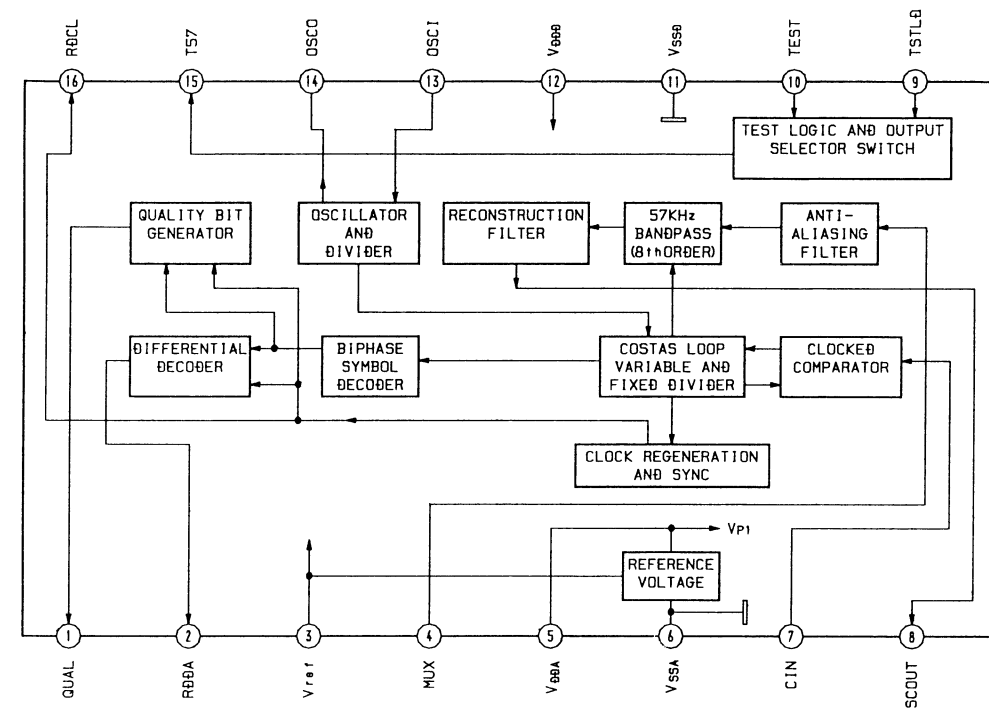
IC1 LA1835



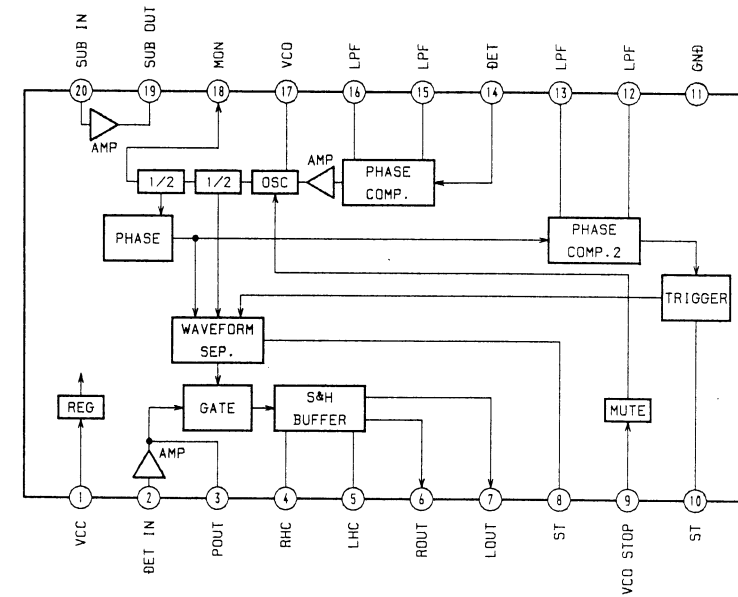
IC51 LC72130



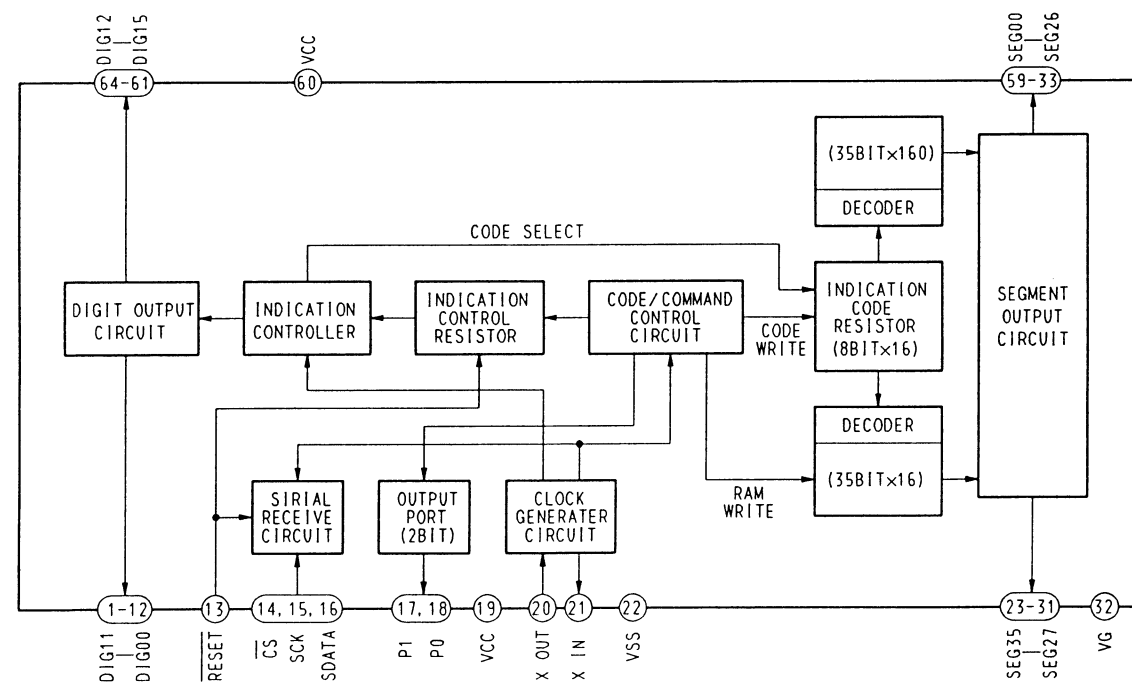
IC302 SAA6579



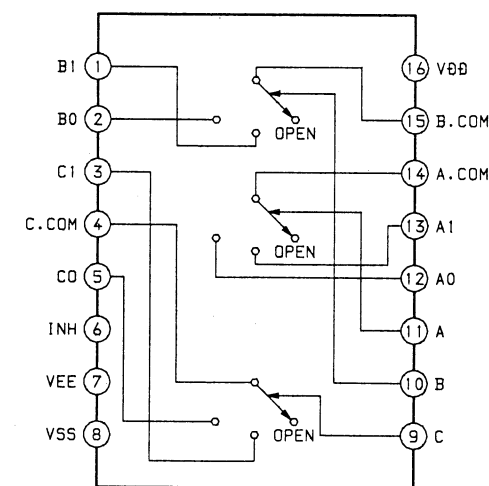
IC1701 IR3R42



IC601 M66004M6FP



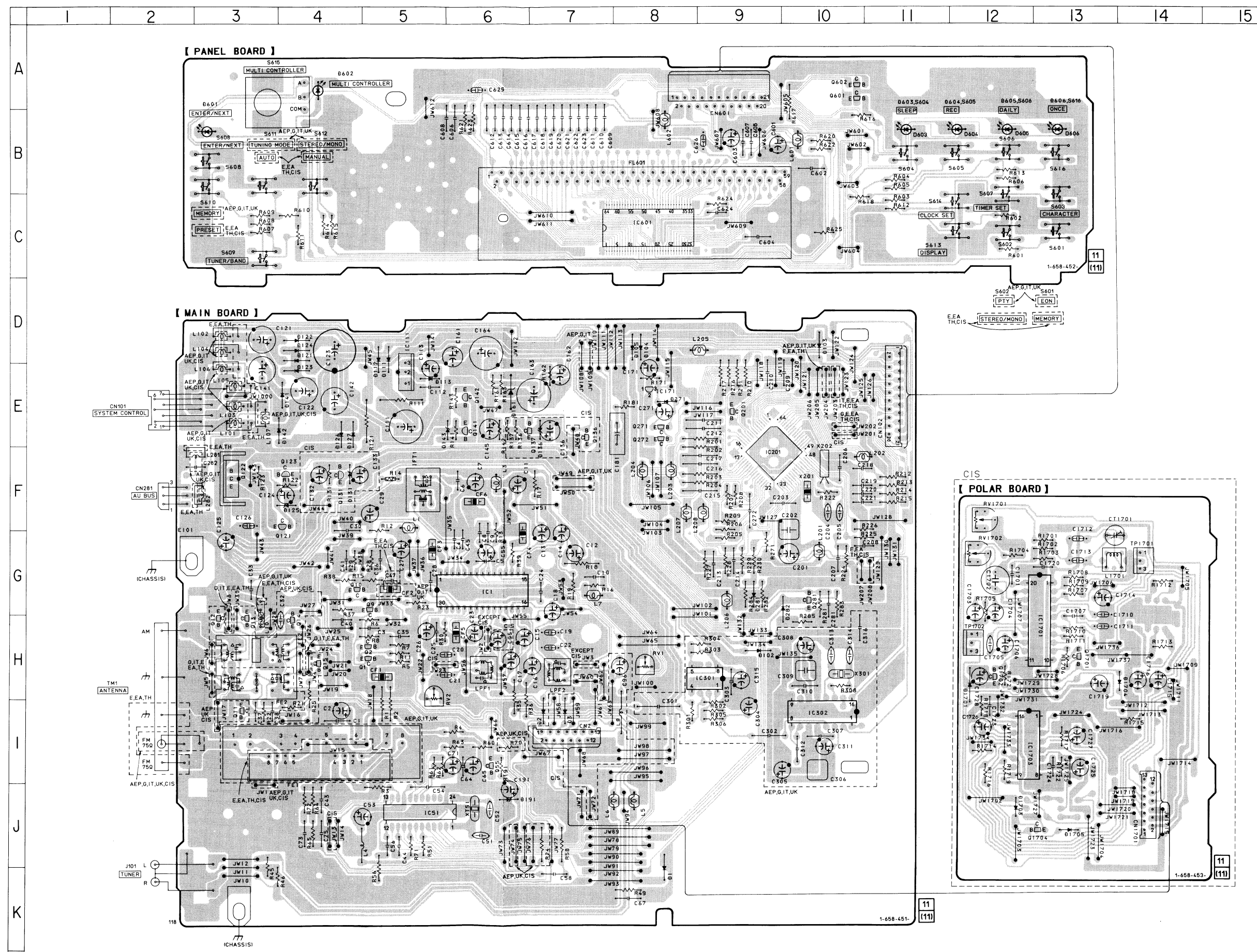
IC1703 MC14053BCP



• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D1	K-8	IC1	G-6
D2	I-7	IC51	J-5
D3	I-7	IC111	E-5
D102	H-9	IC171	E-8
D103	D-10	IC201	F-9
D104	D-8	IC301	H-9
D105	D-8	IC302	I-10
D111	D-5	IC601	C-8
D112	D-5	IC1701	H-3
D113	E-5	IC1703	I-12
D121	E-4		
D122	D-4	Q1	H-5
D123	E-4	Q2	H-5
D124	D-4	Q9	G-5
D125	F-4	Q10	G-4
D126	E-4	Q11	I-3
D127	E-4	Q12	H-3
D131	F-4	Q13	H-3
D136	E-7	Q14	H-4
D141	E-4	Q15	H-4
D142	E-4	Q55	I-6
D143	E-6	Q121	F-4
D161	E-6	Q122	F-3
D191	J-6	Q123	F-4
D271	E-8	Q131	F-4
D281	G-9	Q136	E-7
D282	G-10	Q137	E-7
D601	B-3	Q141	E-6
D602	A-4	Q142	E-6
D603	B-11	Q201	E-9
D604	B-12	Q271	E-8
D605	B-12	Q272	E-8
D606	B-13	Q281	G-10
D1701	H-12	Q601	A-10
D1703	J-12	Q602	A-10
D1704	H-14	Q1701	H-13
D1705	J-13	Q1702	H-12
		Q1704	J-13

5-2. PRINTED WIRING BOARD



Note:

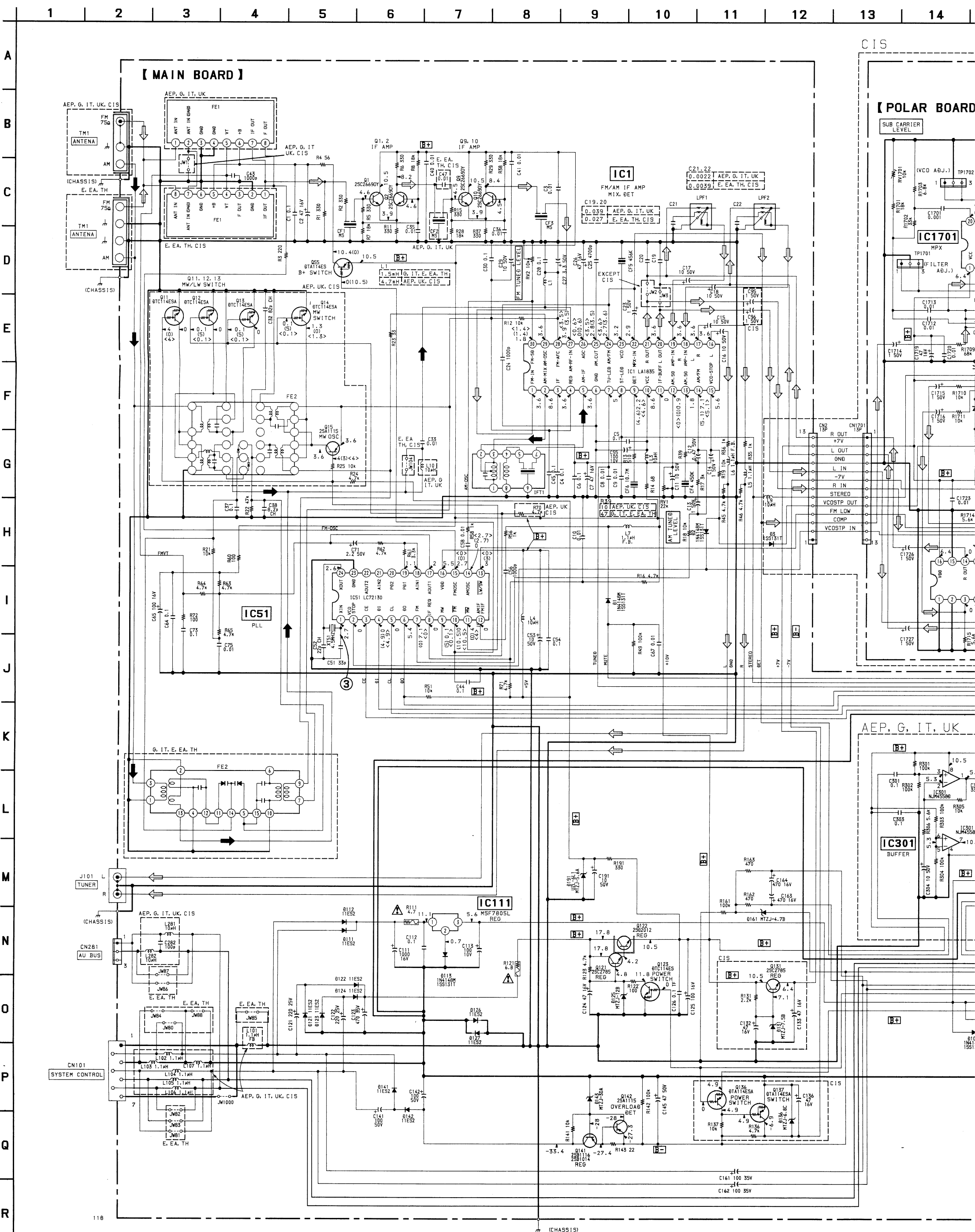
- : parts extracted from the component side.
- : parts extracted from the conductor side.
- △ : internal component.
- : Pattern from the side which enable seeing.

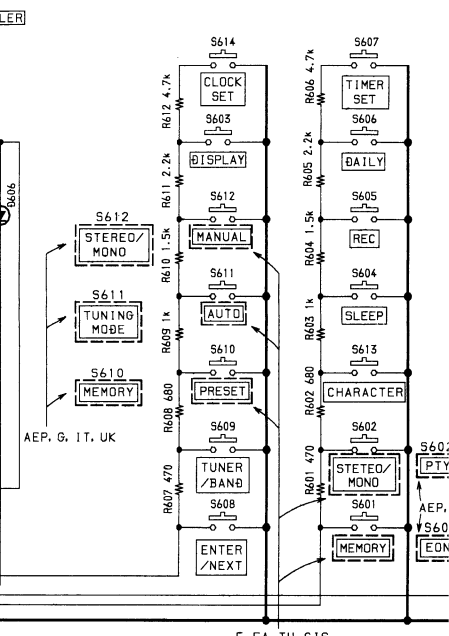
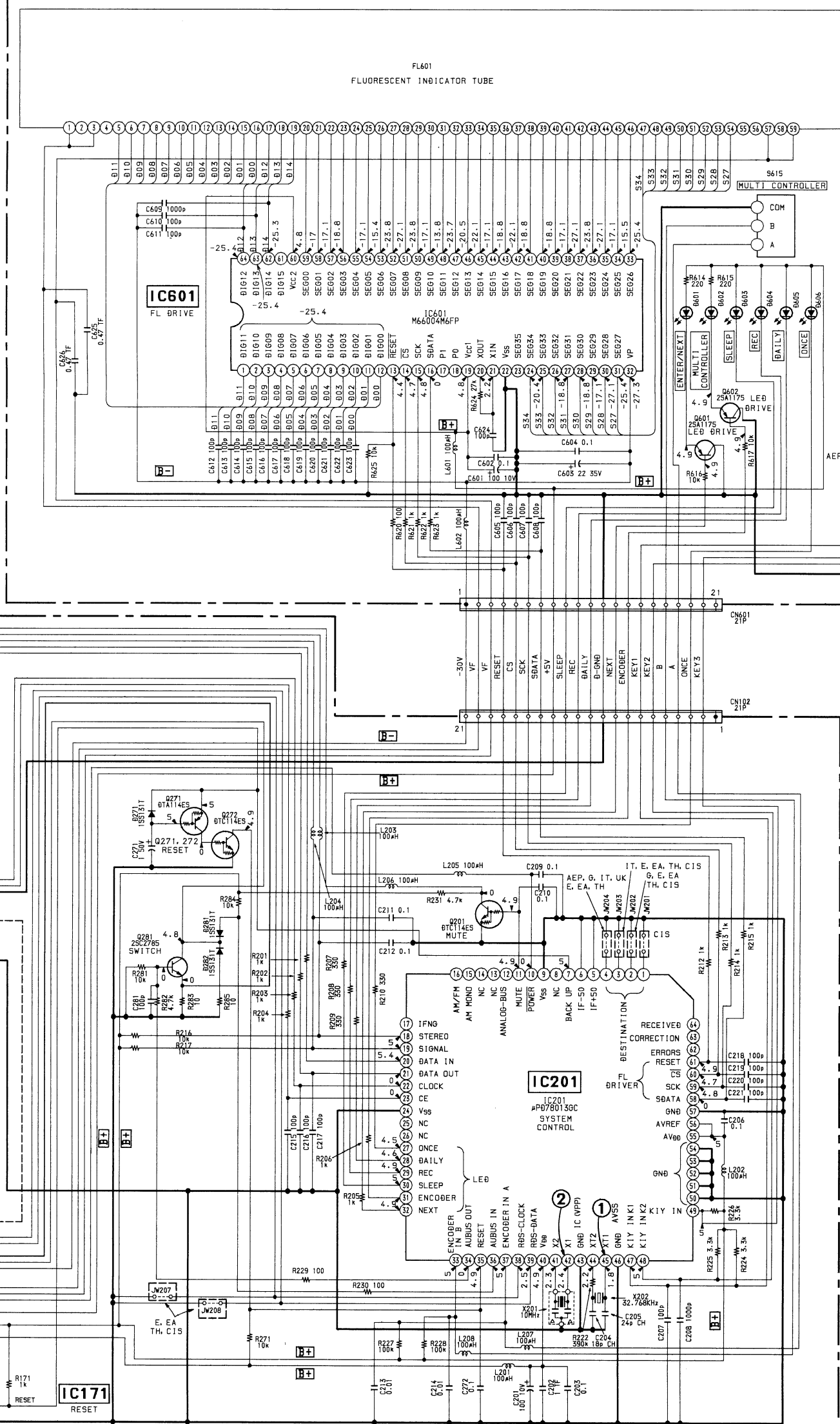
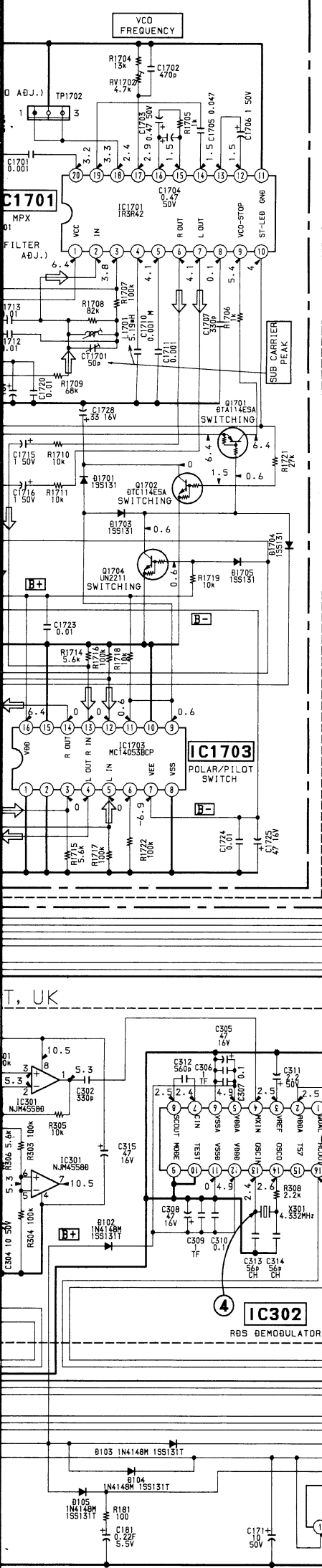
• Abbreviation

- G : German model.
- IT : Italian model.
- EA : Saudi Arabia model.
- TH : Thailand model.


- See page 8 for IC Block Diagrams.
- See page 17 for IC Pin Function. (IC201)


MC-Service








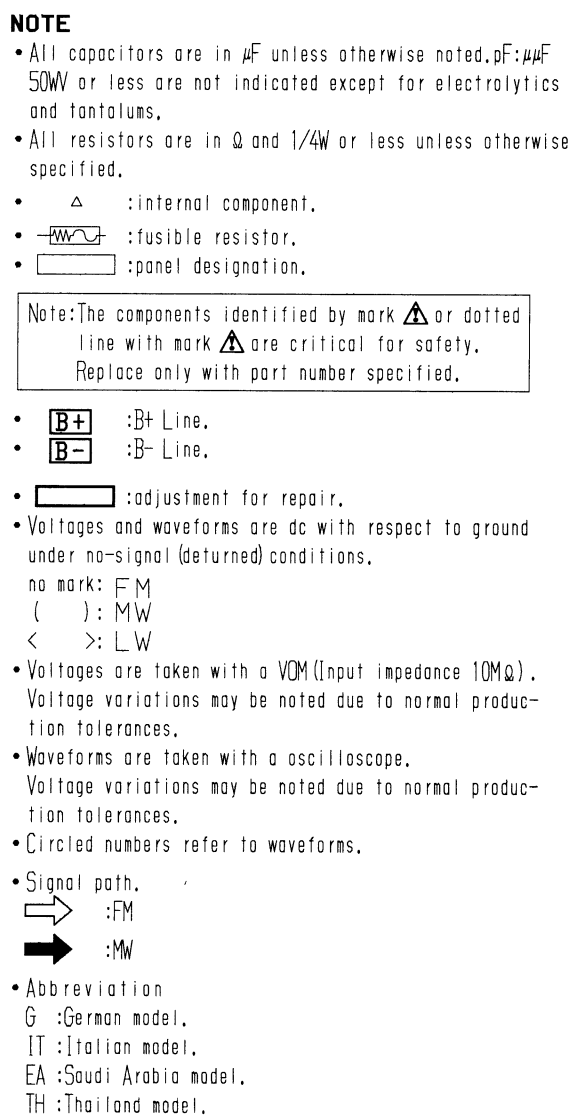
BOARD]

- All capacitors are in μF unless otherwise specified. 50W or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.

-  : internal component.
- : fusible resistor.
- : panel designation.

Note: The components identified by a line with mark  are critical. Replace only with part number

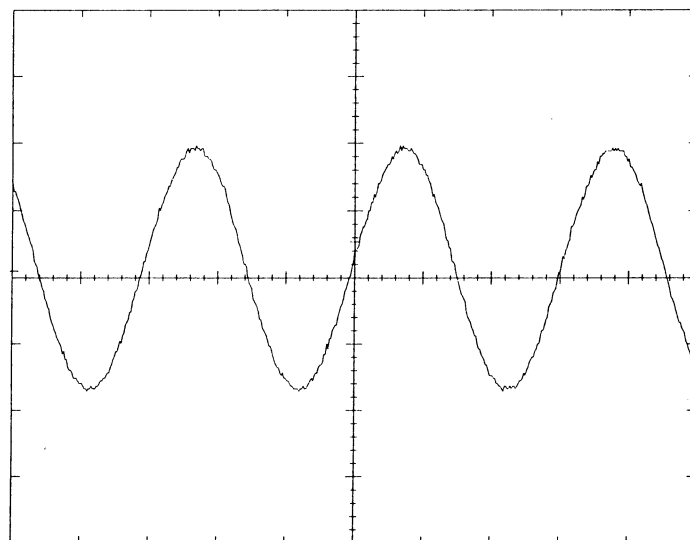
-  :B+ Line.
-  :B- Line.
-  :adjustment for repair.
- Voltages and waveforms are dc with
under no-signal (detuned) conditions
no mark: FM
(): MW
< >: LW
- Voltages are taken with a VOM (Input
Voltage variations may be noted due
to tolerances.
- Waveforms are taken with a oscilloscope.
Voltage variations may be noted due
to tolerances.
- Circled numbers refer to waveforms.
- Signal path.
 :FM
 :MW
- Abbreviation
G :German model.
IT :Italian model.
EA :Saudi Arabia model.
TH :Thailand model.



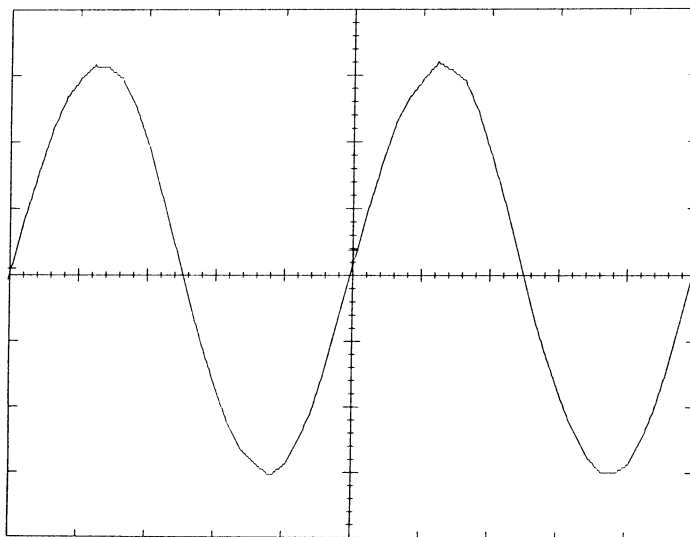
MC-Service

- **Waveforms**

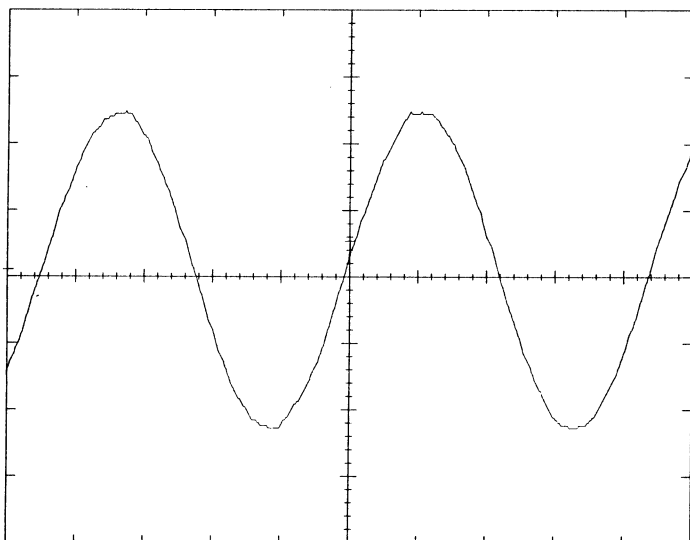
① IC201 ④5 pin 1.8 Vp-p 32.768 kHz



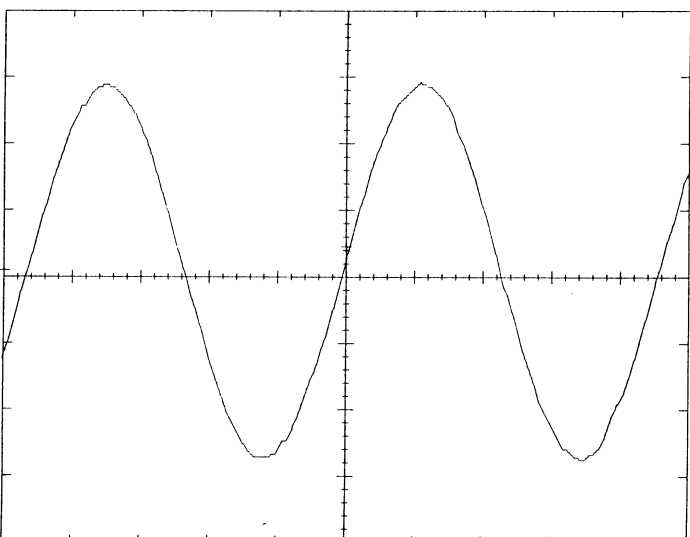
② IC201 ④2 pin 3.1 Vp-p 10 MHz



③ IC51 ① pin 2.4 Vp-p 4.5 MHz



④ IC302 ⑬ pin 2.8 Vp-p 4.332 MHz



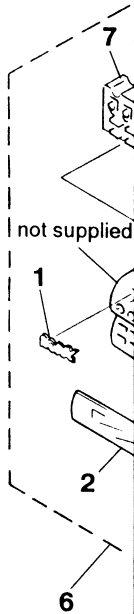
5-4. IC PIN FUNCTION

• IC201 SYSTEM CONTROL (μ PD78013GC)

Pin No.	Pin Name	I/O	Function
1	DESTINATION	I	Destination selection input.
2	DESTINATION	I	
3	DESTINATION	I	
4	DESTINATION	I	
5	IF +50	I	Not used. (Ground)
6	IF -50	O	
7	BACK UP	I	Back up mode input.
8	NC	—	Not used. (open)
9	Vss	—	Ground
10	POWER	O	Power ON/OFF switch control.
11	MUTE	O	Mute output.
12	ANALOG BUS	—	Not used. (open)
13	NC	—	
14	NC	—	
15	AM MONO	—	
16	AM/FM	—	
17	IFNG	—	
18	STEREO	I	STEREO signal input.
19	SIGNAL	I	TUNED signal input.
20	DATA IN	I	Data input. (LC72130, PLL)
21	DATA OUT	O	Data output. (LC72130, PLL)
22	CLOCK	O	Clock output. (LC72130, PLL)
23	CE	O	Chip Enable output. (LC72130, PLL)
24	Vss	—	Ground
25	NC	—	Not used. (open)
26	NC	—	
27	ONCE	O	LED drive output.
28	DAILY	O	
29	REC	O	
30	SLEEP	O	
31	ENCODER	O	
32	NEXT	O	
33	ENCODER IN B	I	ENCODER input. (B)
34	AU BUS OUT	O	Audio bus output.
35	RESET	I	SYSTEM RESET input.
36	AU BUS IN	I	Audio bus input.
37	ENCODER IN A	I	ENCODER input. (A)
38	RDS-CLOCK	I	RDS clock input.
39	RDS-DATA	I	RDS data input.
40	VDD	—	Power supply 5V.

Pin No.	Pin Name	I/O	Function
41	X2	O	System main clock. (10 MHz)
42	X1	I	
43	GND	—	Ground
44	XT2	O	System sub clock. (32.768 kHz)
45	XT1	I	
46	GND	—	Ground
47	KEY IN K1	I	Key input. (analog)
48	KEY IN K2	I	
49	KEY IN	I	Ground
50	GND	—	
51	GND	—	
52	GND	—	
53	GND	—	
54	GND	—	
55	AVDD	—	Analog power supply +5V.
56	AVREF	—	Analog system reference voltage input.
57	GND	—	Ground
58	SDATA	O	Fluorescent tube data output. (IC601)
59	SCK	O	Fluorescent tube clock output. (IC601)
60	$\overline{\text{CS}}$	O	Fluorescent tube chip select signal output. (IC601)
61	RESET	O	Fluorescent tube reset signal output. (IC601)
62	ERRORS	I	Note used. (open)
63	CORRECTION	O	
64	RECEIVED	O	

NOTE:
• Items marked seldom required should be a
• Color Indicator KNOB, BA



Ref. No.	Par
1	4-9
2	X-4
2	X-4
3	4-9
3	4-9
4	4-9
5	4-9
5	4-9
5	4-9
6	X-4
6	X-4
6	X-4
6	X-4
7	4-9
7	4-9
8	4-9
* 9	A-4
* 9	A-4
10	4-9

SECTION 6 EXPLODED VIEW

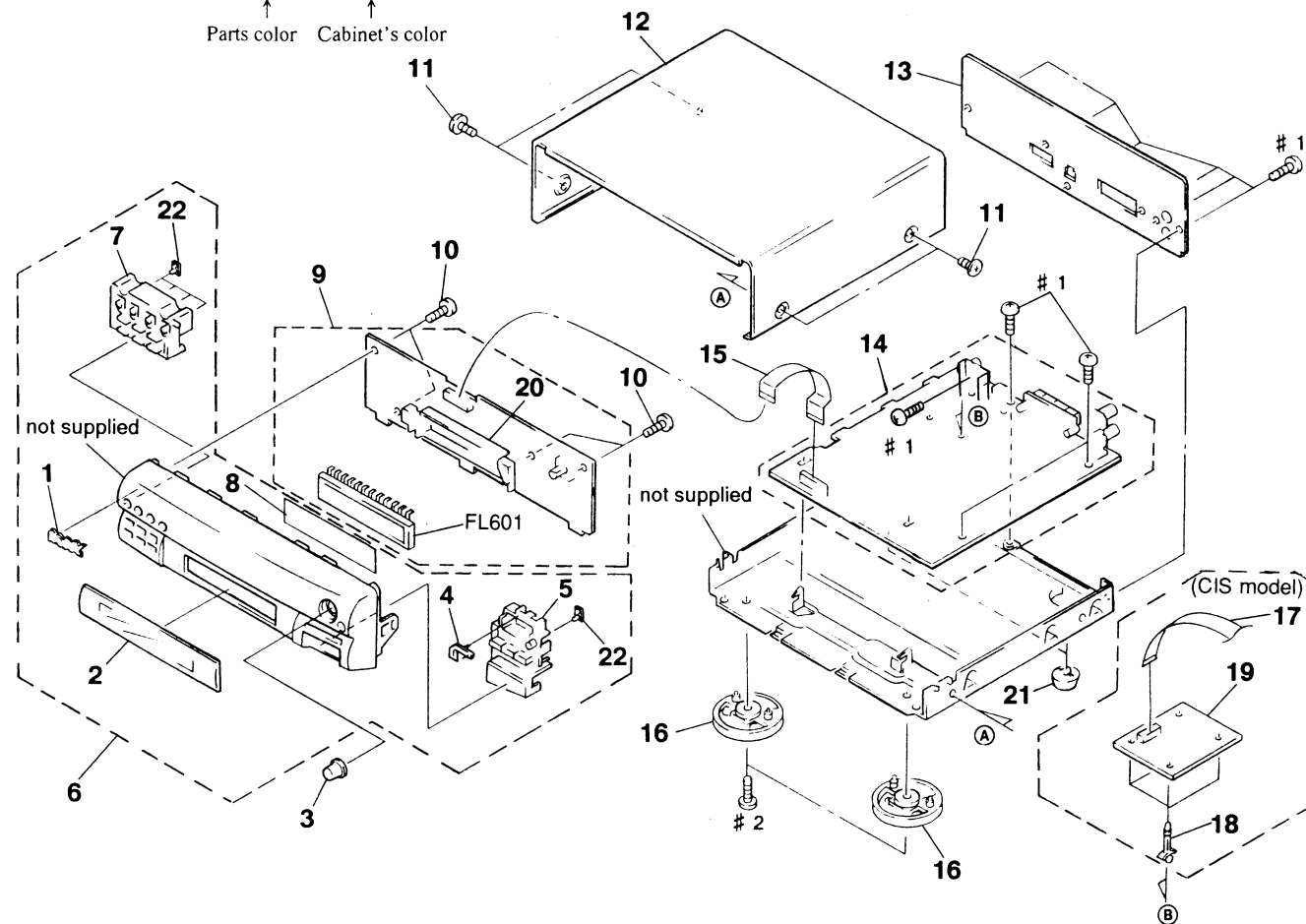
NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
KNOB, BALANCE (WHITE) ... (RED)

Parts color Cabinet's color

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

- Abbreviation
G : German model
IT : Italian model
EA : Saudi Arabia model
TH : Thailand model



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-962-708-11	EMBLEM (4-A), SONY		11	3-363-099-01	SCREW (CASE 3 TP2)	
2	X-4946-909-1	WINDOW (FL) ASSY (for SILVER)		* 12	4-970-927-21	CASE (BLACK)	
2	X-4946-912-1	WINDOW (FL) ASSY (for BLACK)		* 12	4-970-927-41	CASE (SILVER)	
3	4-977-680-11	KNOB (JOG) (GRAY)... (SILVER)		* 13	4-978-999-01	PANEL, BACK (E)	
3	4-977-680-21	KNOB (JOG) (BLACK)... (BLACK)		* 13	4-978-999-11	PANEL, BACK (Made in France)	
4	4-977-705-11	INDICATOR (JOG)				(AEP, UK, G, IT, CIS)	
5	4-977-704-11	BUTTON (BAND) (GRAY)... (SILVER)		* 13	4-978-999-21	PANEL, BACK (Made in Malaysia) (AEP, UK)	
		(AEP, UK, G, IT)		* 13	4-978-999-31	PANEL, BACK (EA)	
5	4-977-704-21	BUTTON (BAND) (GRAY)... (SILVER)		* 13	4-978-999-41	PANEL, BACK (TH)	
		(E, CIS, EA, TH)		* 14	A-4378-850-A	MAIN BOARD, COMPLETE (E, EA, TH)	
5	4-977-704-31	BUTTON (BAND) (BLACK)... (BLACK)		* 14	A-4378-863-A	MAIN BOARD, COMPLETE (AEP, UK)	
		(AEP, UK, G, IT)		* 14	A-4378-865-A	MAIN BOARD, COMPLETE (G)	
6	X-4946-594-1	PANEL ASSY (S), FRONT (SILVER) (E, EA)					
6	X-4946-834-1	PANEL ASSY (BP), FRONT (BLACK)		* 14	A-4389-478-A	MAIN BOARD, COMPLETE (IT)	
		(AEP, UK, G, IT)		* 14	A-4389-479-A	MAIN BOARD, COMPLETE (CIS)	
6	X-4946-956-1	PANEL ASSY (SP), FRONT (SILVER) (CIS, TH)		15	1-773-144-11	WIRE (FLAT TYPE) (21 CORE)	
6	X-4946-965-1	PANEL ASSY (SP), FRONT (SILVER)		16	4-977-699-11	LEG (F)	
		(AEP, UK, G, IT)		17	1-751-688-11	WIRE (FLAT TYPE) (13 CORE) (CIS)	
7	4-977-703-11	BUTTON (TIMER) (GRAY)... (SILVER)		18	4-924-098-91	HOLDER, PC BOARD (CIS)	
		(AEP, UK, G, E, CIS, EA, TH)		* 19	A-4389-480-A	POLAR BOARD, COMPLETE (CIS)	
7	4-977-703-21	BUTTON (TIMER) (BLACK)... (BLACK)		* 20	4-979-798-01	HOLDER (FL)	
		(AEP, UK, G, IT)		21	4-965-822-01	FOOT	
8	4-979-353-11	FILTER (MD)		22	4-977-674-11	INDICATOR (ENTER)	
* 9	A-4378-851-A	PANEL BOARD, COMPLETE (E, EA, TH)		FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT	
* 9	A-4378-864-A	PANEL BOARD, COMPLETE (AEP, UK, G, IT, CIS)					
10	4-951-620-01	SCREW (2.6X8), +BVTP					

MAIN

NOTE:

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SECTION 7 ELECTRICAL PARTS LIST

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F : nonflammable

- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB..., uPC...: μ PC..., uPD...: μ PD...
- CAPACITORS
uF: μ F
- COILS
uH: μ H
- Abbreviation
G : German model
IT : Italian model
EA : Saudi Arabia model
TH : Thailand model

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-4378-863-A	MAIN BOARD, COMPLETE (AEP, UK)		C21	1-137-436-11	FILM	0.0039uF 5% 50V (E, EA, TH, CIS)
	*****			C22	1-137-389-11	FILM	0.0022uF 5% 100V (AEP, G, IT, UK)
*	A-4378-850-A	MAIN BOARD, COMPLETE (E, EA, TH)					
	*****			C22	1-137-436-11	FILM	0.0039uF 5% 50V (E, EA, TH, CIS)
*	A-4378-865-A	MAIN BOARD, COMPLETE (G)		C23	1-124-903-11	ELECT	1uF 20% 50V
	*****			C24	1-162-294-31	CERAMIC	0.001uF 10% 50V
*	A-4389-478-A	MAIN BOARD, COMPLETE (IT)		C25	1-162-600-11	CERAMIC	0.0047uF 30% 16V
	*****			C26	1-126-967-11	ELECT	47uF 20% 16V
*	A-4389-479-A	MAIN BOARD, COMPLETE (CIS)		C27	1-126-962-11	ELECT	3.3uF 20% 50V
	*****			C28	1-164-159-21	CERAMIC	0.1uF 50V
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S		C29	1-126-964-11	ELECT	10uF 20% 50V
	< CAPACITOR >			C30	1-164-159-21	CERAMIC	0.1uF 50V
C1	1-164-159-21	CERAMIC	0.1uF 50V	C32	1-102-527-11	CERAMIC	82PF 5% 50V (AEP, UK, CIS)
C2	1-126-967-11	ELECT	47uF 20% 16V				
C3	1-162-306-11	CERAMIC	0.01uF 30% 16V	C33	1-162-306-11	CERAMIC	0.01uF 30% 16V
C4	1-164-159-21	CERAMIC	0.1uF 50V	C35	1-162-306-11	CERAMIC	0.01uF 30% 16V
C5	1-164-159-21	CERAMIC	0.1uF 50V	C36	1-162-306-11	CERAMIC	0.01uF 30% 16V
				C37	1-164-159-21	CERAMIC	0.1uF 50V
C6	1-164-159-21	CERAMIC	0.1uF 50V	C38	1-162-198-31	CERAMIC	8.2PF 10% 50V
C7	1-126-967-11	ELECT	47uF 20% 16V				
C8	1-162-306-11	CERAMIC	0.01uF 30% 16V	C40	1-162-306-11	CERAMIC	0.01uF 30% 16V
C9	1-162-306-11	CERAMIC	0.01uF 30% 16V	C41	1-162-306-11	CERAMIC	0.01uF 30% 16V
C10	1-162-306-11	CERAMIC	0.01uF 30% 16V	C43	1-162-294-31	CERAMIC	0.001uF 10% 50V
				C44	1-164-159-21	CERAMIC	0.1uF 50V
C11	1-126-964-11	ELECT	10uF 20% 50V	C45	1-164-159-21	CERAMIC	0.1uF 50V
C12	1-124-902-00	ELECT	0.47uF 20% 50V				
C13	1-124-903-11	ELECT	1uF 20% 50V	C47	1-102-129-00	CERAMIC	0.01uF 10% 50V (E, EA, TH, CIS)
C14	1-124-903-11	ELECT	1uF 20% 50V				
C15	1-126-964-11	ELECT	10uF 20% 50V	C51	1-102-518-11	CERAMIC	33PF 5% 50V
				C52	1-102-959-00	CERAMIC	22PF 5% 50V
C16	1-126-964-11	ELECT	10uF 20% 50V	C53	1-126-964-11	ELECT	10uF 20% 50V
C17	1-126-964-11	ELECT	10uF 20% 50V	C54	1-164-159-21	CERAMIC	0.1uF 50V
C18	1-126-964-11	ELECT	10uF 20% 50V				
C19	1-136-160-00	FILM	0.039uF 5% 50V (AEP, G, IT, UK)	C55	1-126-933-11	ELECT	100uF 20% 10V
				C56	1-162-294-31	CERAMIC	0.001uF 10% 50V
C19	1-136-158-00	FILM	0.027uF 5% 50V (E, EA, TH, CIS)	C58	1-162-306-11	CERAMIC	0.01uF 30% 16V
				C64	1-164-159-21	CERAMIC	0.1uF 50V
				C65	1-126-933-11	ELECT	100uF 20% 16V
C20	1-136-160-00	FILM	0.039uF 5% 50V (AEP, G, IT, UK)				
				C67	1-162-306-11	CERAMIC	0.01uF 30% 16V
C20	1-136-158-00	FILM	0.027uF 5% 50V (E, EA, TH, CIS)	C71	1-124-925-11	ELECT	2.2uF 20% 100V
				C73	1-164-159-21	CERAMIC	0.1uF 50V
C21	1-137-389-11	FILM	0.0022uF 5% 100V (AEP, G, IT, UK)	C75	1-162-306-11	CERAMIC	0.01uF 30% 16V
				C95	1-124-903-11	ELECT	1uF 20% 50V (CIS)

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C96	1-124-903-11	ELECT	1uF	20%	50V (CIS)	C302	1-162-288-31	CERAMIC	330PF	10%	50V (AEP, G, IT, UK)
C111	1-126-952-11	ELECT	1000uF	20%	16V						
C112	1-164-159-21	CERAMIC	0. 1uF		50V	C303	1-164-159-21	CERAMIC	0. 1uF		50V (AEP, G, IT, UK)
C113	1-126-933-11	ELECT	100uF	20%	10V						
C121	1-104-666-11	ELECT	220uF	20%	25V	C304	1-126-964-11	ELECT	10uF	20%	50V (AEP, G, IT, UK)
C122	1-104-666-11	ELECT	220uF	20%	25V	C305	1-126-967-11	ELECT	47uF	20%	16V (AEP, G, IT, UK)
C123	1-126-951-11	ELECT	470uF	20%	35V	C306	1-136-177-00	FILM	1uF	5%	50V (AEP, G, IT, UK)
C124	1-126-967-11	ELECT	47uF	20%	16V	C307	1-164-159-21	CERAMIC	0. 1uF		50V (AEP, G, IT, UK)
C125	1-126-933-11	ELECT	100uF	20%	16V						
C126	1-136-165-00	FILM	0. 1uF	5%	50V	C308	1-126-967-11	ELECT	47uF	20%	16V (AEP, G, IT, UK)
C132	1-126-967-11	ELECT	47uF	20%	16V (CIS)	C309	1-136-177-00	FILM	1uF	5%	50V (AEP, G, IT, UK)
C133	1-126-967-11	ELECT	47uF	20%	16V (CIS)	C310	1-164-159-21	CERAMIC	0. 1uF		50V (AEP, G, IT, UK)
C136	1-126-967-11	ELECT	47uF	20%	16V (CIS)	C311	1-124-925-11	ELECT	2. 2uF	20%	100V (AEP, G, IT, UK)
C141	1-126-968-11	ELECT	100uF	20%	50V	C312	1-162-291-31	CERAMIC	560PF	10%	50V (AEP, G, IT, UK)
C142	1-126-968-11	ELECT	100uF	20%	50V						
C145	1-126-967-11	ELECT	47uF	20%	50V	C313	1-101-884-00	CERAMIC	56PF	5%	50V (AEP, G, IT, UK)
C161	1-126-948-11	ELECT	100uF	20%	35V	C314	1-101-884-00	CERAMIC	56PF	5%	50V (AEP, G, IT, UK)
C162	1-126-948-11	ELECT	100uF	20%	35V	C315	1-126-967-11	ELECT	47uF	20%	16V (AEP, G, IT, UK)
C163	1-126-935-11	ELECT	470uF	20%	16V	C316	1-164-159-21	CERAMIC	0. 1uF		50V (AEP, G, IT, UK)
C164	1-126-935-11	ELECT	470uF	20%	16V			< FILTER >			
C171	1-126-964-11	ELECT	10uF	20%	50V	CF1	1-579-374-71	FILTER, CERAMIC	(AEP, G, IT, UK)		
C181	1-125-705-11	CAPACITOR	0. 22F	0	5. 5V	CF1	1-567-389-11	FILTER, CERAMIC	(E, EA, TH, CIS)		
C191	1-126-964-11	ELECT	10uF	20%	50V	CF2	1-760-393-11	FILTER, CERAMIC	(AEP, G, IT, UK)		
C201	1-126-933-11	ELECT	100uF	20%	10V	CF3	1-760-393-11	FILTER, CERAMIC	(AEP, G, IT, UK)		
C202	1-136-177-00	FILM	1uF	5%	50V	CF3	1-567-389-11	FILTER, CERAMIC	(E, EA, TH, CIS)		
C203	1-164-159-21	CERAMIC	0. 1uF		50V	CF4	1-527-981-00	FILTER, CERAMIC			
C204	1-102-953-00	CERAMIC	18PF	5%	50V	CF5	1-577-075-11	OSCILLATOR, CERAMIC			
C205	1-102-960-00	CERAMIC	24PF	5%	50V	CF6	1-760-220-11	FILTER, CERAMIC			
C206	1-164-159-21	CERAMIC	0. 1uF		50V			< CONNECTOR >			
C207	1-162-282-31	CERAMIC	100PF	10%	50V	* CN2	1-568-832-11	SOCKET, CONNECTOR 13P	(CIS)		
C208	1-162-294-31	CERAMIC	0. 001uF	10%	50V	CN101	1-770-158-21	HOUSING, CONNECTOR 7P	(SYSTEM CONTROL)		
C209	1-164-159-21	CERAMIC	0. 1uF		50V	CN102	1-568-838-11	SOCKET, CONNECTOR 21P			
C210	1-164-159-21	CERAMIC	0. 1uF		50V	* CN281	1-565-561-11	PIN, CONNECTOR 3P	(AU BUS)		
C211	1-164-159-21	CERAMIC	0. 1uF		50V			< DIODE >			
C212	1-164-159-21	CERAMIC	0. 1uF		50V	D1	8-719-815-85	DIODE	1S1585		
C213	1-162-306-11	CERAMIC	0. 01uF	30%	16V	D2	8-719-815-85	DIODE	1S1585		
C214	1-162-306-11	CERAMIC	0. 01uF	30%	16V	D3	8-719-815-85	DIODE	1S1585 (CIS)		
C215	1-162-282-31	CERAMIC	100PF	10%	50V	D102	8-719-815-85	DIODE	1S1585 (AEP, G, IT, UK)		
C216	1-162-282-31	CERAMIC	100PF	10%	50V	D103	8-719-815-85	DIODE	1S1585		
C217	1-162-282-31	CERAMIC	100PF	10%	50V						
C218	1-162-282-31	CERAMIC	100PF	10%	50V						
C219	1-162-282-31	CERAMIC	100PF	10%	50V						
C220	1-162-282-31	CERAMIC	100PF	10%	50V						
C221	1-162-282-31	CERAMIC	100PF	10%	50V						
C271	1-124-903-11	ELECT	1uF	20%	50V						
C272	1-164-159-21	CERAMIC	0. 1uF		50V						
C281	1-162-282-31	CERAMIC	100PF	10%	50V						
C282	1-162-282-31	CERAMIC	100PF	10%	50V (AEP, G, IT, UK, CIS)						
C301	1-164-159-21	CERAMIC	0. 1uF		50V (AEP, G, IT, UK)						

MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
D104	8-719-815-85	DIODE 1S1585		L4	1-410-509-11	INDUCTOR 10uH	
D105	8-719-815-85	DIODE 1S1585		L5	1-410-397-21	FERRITE BEAD INDUCTOR	
D111	8-719-200-82	DIODE 11ES2		L6	1-410-397-21	FERRITE BEAD INDUCTOR	
D112	8-719-200-82	DIODE 11ES2		L7	1-410-397-21	FERRITE BEAD INDUCTOR	
D113	8-719-815-85	DIODE 1S1585		L9	1-410-509-11	INDUCTOR 10uH (CIS)	
D121	8-719-200-82	DIODE 11ES2		L10	1-414-183-41	INDUCTOR 10uH (AEP, G, IT, UK)	
D122	8-719-200-82	DIODE 11ES2		L101	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
D123	8-719-200-82	DIODE 11ES2		L102	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
D124	8-719-200-82	DIODE 11ES2		L103	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
D125	8-719-110-31	DIODE RD12ES-B2		L104	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
D126	8-719-200-82	DIODE 11ES2		L105	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
D127	8-719-200-82	DIODE 11ES2		L106	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
D131	8-719-921-63	DIODE MTZJ-7.5B (CIS)		L107	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
D136	8-719-109-97	DIODE RD6.8ES-B2 (CIS)		L201	1-414-189-31	INDUCTOR 100uH	
D141	8-719-200-82	DIODE 11ES2		L202	1-414-189-31	INDUCTOR 100uH	
D142	8-719-200-82	DIODE 11ES2		L203	1-410-521-11	INDUCTOR 100uH	
D143	8-719-982-19	DIODE MTZJ-30A		L204	1-410-521-11	INDUCTOR 100uH	
D161	8-719-010-34	DIODE UZ-4.7BSC		L205	1-410-521-11	INDUCTOR 100uH	
D191	8-719-109-88	DIODE RD5.6ES-B1		L206	1-410-521-11	INDUCTOR 100uH	
D271	8-719-815-85	DIODE 1S1585		L207	1-410-521-11	INDUCTOR 100uH	
D281	8-719-815-85	DIODE 1S1585		L208	1-410-521-11	INDUCTOR 100uH	
D282	8-719-815-85	DIODE 1S1585		L281	1-410-509-11	INDUCTOR 10uH (AEP, G, IT, UK, CIS)	
< FRONTEND >				L282	1-410-509-11	INDUCTOR 10uH (AEP, G, IT, UK, CIS)	
FE1	1-693-253-21	FRONT END (4 GANG) (AEP, G, IT, UK)		< FILTER >			
FE1	1-693-090-51	FRONT END (FM) (2 GANG) (E, EA, TH)		LPF1	1-239-597-11	FILTER, LOW PASS	
FE1	1-693-244-21	FRONT END (3 GANG) (CIS)		LPF2	1-239-597-11	FILTER, LOW PASS	
FE2	1-233-514-11	ENCAPSULATED COMPONENT (AEP, UK, CIS)		< TRANSISTOR >			
FE2	1-239-634-11	ENCAPSULATED COMPONENT, AM. RF (G, IT, E, EA, TH)		Q1	8-729-230-99	TRANSISTOR 2SC2669-OY	
< IC >				Q2	8-729-230-99	TRANSISTOR 2SC2669-OY	
IC1	8-759-176-03	IC LA1835		Q9	8-729-230-99	TRANSISTOR 2SC2669-OY	
IC51	8-759-288-54	IC LC72130		Q10	8-729-230-99	TRANSISTOR 2SC2669-OY	
IC111	8-759-231-53	IC TA7805S		Q11	8-729-029-67	TRANSISTOR DTC114ESA-TP (AEP, UK, CIS)	
IC171	8-759-165-80	IC PST600C-T		Q12	8-729-029-67	TRANSISTOR DTC114ESA-TP (AEP, UK, CIS)	
IC201	8-759-338-81	IC uPD78013GC-652-AB8		Q13	8-729-029-67	TRANSISTOR DTC114ESA-TP (AEP, UK, CIS)	
IC301	8-759-634-51	IC M5218AP (AEP, G, IT, UK)		Q14	8-729-029-67	TRANSISTOR DTC114ESA-TP (AEP, UK, CIS)	
IC302	8-759-169-99	IC SAA6579 (AEP, G, IT, UK)		Q15	8-729-119-76	TRANSISTOR 2SA1175-HFE (AEP, UK, CIS)	
< IFT >				Q55	8-729-029-21	TRANSISTOR DTA114ESA-TP	
IFT1	1-409-636-11	TRANSFORMER, IF (CERAMIC FILTER)		Q121	8-729-119-78	TRANSISTOR 2SC2785-HFE	
< JACK >				Q122	8-729-209-15	TRANSISTOR 2SD2012	
J101	1-770-272-11	JACK, PIN 2P (TUNER)		Q123	8-729-029-67	TRANSISTOR DTC114ESA-TP	
< COIL >				Q131	8-729-119-78	TRANSISTOR 2SC2785-HFE (CIS)	
L1	1-407-500-00	INDUCTOR 4.7mH (AEP, UK, CIS)		Q136	8-729-029-21	TRANSISTOR DTA114ESA-TP (CIS)	
L1	1-410-688-31	INDUCTOR 1.5mH (G, IT, E, EA, TH)		Q137	8-729-029-21	TRANSISTOR DTA114ESA-TP (CIS)	
L3	1-414-183-41	INDUCTOR 10uH		Q141	8-729-118-00	TRANSISTOR 2SB1116-L	
				Q142	8-729-119-76	TRANSISTOR 2SA1175-HFE	
				Q201	8-729-029-67	TRANSISTOR DTC114ESA-TP	
				Q271	8-729-029-21	TRANSISTOR DTA114ESA-TP	

Ref. No.	Part No.	Description	Remark		Ref. No.	Part No.	Description	Remark	
Q272	8-729-029-67	TRANSISTOR	DTC114ESA-TP		R70	1-249-425-11	CARBON	4.7K 5%	1/4W (AEP, UK, CIS)
Q281	8-729-119-78	TRANSISTOR	2SC2785-HFE		R71	1-249-425-11	CARBON	4.7K 5%	1/4W
< RESISTOR >					R72	1-247-807-31	CARBON	100 5%	1/4W
R1	1-249-411-11	CARBON	330 5%	1/4W	△R111	1-217-641-00	FUSIBLE	4.7 5%	1/4W F
R2	1-249-411-11	CARBON	330 5%	1/4W	△R121	1-217-642-81	FUSIBLE	6.8 5%	1/4W F
R3	1-247-815-91	CARBON	220 5%	1/4W	R122	1-247-807-31	CARBON	100 5%	1/4W
R4	1-249-402-11	CARBON	56 5%	1/4W	R123	1-249-425-11	CARBON	4.7K 5%	1/4W
R5	1-249-411-11	CARBON	330 5%	1/4W	R131	1-249-421-11	CARBON	2.2K 5%	1/4W (CIS)
R6	1-249-411-11	CARBON	330 5%	1/4W	R136	1-249-425-11	CARBON	4.7K 5%	1/4W (CIS)
R7	1-249-432-11	CARBON	18K 5%	1/4W	R137	1-249-429-11	CARBON	10K 5%	1/4W (CIS)
R8	1-249-432-11	CARBON	18K 5%	1/4W	R141	1-249-429-11	CARBON	10K 5%	1/4W
R11	1-249-411-11	CARBON	330 5%	1/4W	R142	1-249-441-11	CARBON	100K 5%	1/4W
R12	1-249-429-11	CARBON	10K 5%	1/4W	R143	1-247-791-91	CARBON	22 5%	1/4W
R13	1-249-442-11	CARBON	510 5%	1/4W	R161	1-249-441-11	CARBON	100K 5%	1/4W
R14	1-249-403-11	CARBON	68 5%	1/4W	R162	1-249-413-11	CARBON	470 5%	1/4W
R15	1-249-411-11	CARBON	330 5%	1/4W	R163	1-249-413-11	CARBON	470 5%	1/4W
R16	1-249-425-11	CARBON	4.7K 5%	1/4W	R171	1-249-417-11	CARBON	1K 5%	1/4W
R17	1-247-842-11	CARBON	3K 5%	1/4W	R181	1-247-807-31	CARBON	100 5%	1/4W
R18	1-249-429-11	CARBON	10K 5%	1/4W	R191	1-249-411-11	CARBON	330 5%	1/4W
R19	1-249-429-11	CARBON	10K 5%	1/4W	R201	1-249-417-11	CARBON	1K 5%	1/4W
R21	1-249-429-11	CARBON	10K 5%	1/4W	R202	1-249-417-11	CARBON	1K 5%	1/4W
R22	1-249-437-11	CARBON	47K 5%	1/4W	R203	1-249-417-11	CARBON	1K 5%	1/4W
R23	1-249-399-11	CARBON	33 5%	1/4W	R204	1-249-417-11	CARBON	1K 5%	1/4W
R24	1-249-425-11	CARBON	4.7K 5%	1/4W (AEP, UK, CIS)	R205	1-249-417-11	CARBON	1K 5%	1/4W
R25	1-249-429-11	CARBON	10K 5%	1/4W (AEP, UK, CIS)	R206	1-249-417-11	CARBON	1K 5%	1/4W
R28	1-249-432-11	CARBON	18K 5%	1/4W	R207	1-249-411-11	CARBON	330 5%	1/4W
R29	1-249-411-11	CARBON	330 5%	1/4W	R208	1-249-411-11	CARBON	330 5%	1/4W
R35	1-249-417-11	CARBON	1K 5%	1/4W	R209	1-249-411-11	CARBON	330 5%	1/4W
R36	1-249-417-11	CARBON	1K 5%	1/4W	R210	1-249-411-11	CARBON	330 5%	1/4W
R37	1-249-411-11	CARBON	330 5%	1/4W	R212	1-249-417-11	CARBON	1K 5%	1/4W
R38	1-249-432-11	CARBON	18K 5%	1/4W	R213	1-249-417-11	CARBON	1K 5%	1/4W
R39	1-249-393-11	CARBON	10 5%	1/4W (AEP, UK, CIS)	R214	1-249-417-11	CARBON	1K 5%	1/4W
R39	1-249-401-11	CARBON	47 5%	1/4W (G, IT, E, EA, TH)	R215	1-249-417-11	CARBON	1K 5%	1/4W
R45	1-249-425-11	CARBON	4.7K 5%	1/4W	R216	1-249-429-11	CARBON	10K 5%	1/4W
R46	1-249-425-11	CARBON	4.7K 5%	1/4W	R217	1-249-429-11	CARBON	10K 5%	1/4W
R49	1-249-441-11	CARBON	100K 5%	1/4W	R222	1-247-893-11	CARBON	390K 5%	1/4W
R51	1-249-429-11	CARBON	10K 5%	1/4W	R224	1-249-423-11	CARBON	3.3K 5%	1/4W
R56	1-249-417-11	CARBON	1K 5%	1/4W	R225	1-249-423-11	CARBON	3.3K 5%	1/4W
R58	1-249-417-11	CARBON	1K 5%	1/4W	R226	1-249-423-11	CARBON	3.3K 5%	1/4W
R60	1-249-405-11	CARBON	100 5%	1/4W	R227	1-249-441-11	CARBON	100K 5%	1/4W
R61	1-249-423-11	CARBON	3.3K 5%	1/4W	R228	1-249-441-11	CARBON	100K 5%	1/4W
R62	1-249-425-11	CARBON	4.7K 5%	1/4W	R229	1-247-807-31	CARBON	100 5%	1/4W
R63	1-249-425-11	CARBON	4.7K 5%	1/4W	R230	1-247-807-31	CARBON	100 5%	1/4W
R64	1-249-425-11	CARBON	4.7K 5%	1/4W	R231	1-249-425-11	CARBON	4.7K 5%	1/4W
R65	1-249-425-11	CARBON	4.7K 5%	1/4W	R271	1-249-429-11	CARBON	10K 5%	1/4W
					R281	1-249-429-11	CARBON	10K 5%	1/4W
					R282	1-249-425-11	CARBON	4.7K 5%	1/4W
					R283	1-249-393-11	CARBON	10 5%	1/4W
					R284	1-249-429-11	CARBON	10K 5%	1/4W

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

MAIN

PANEL

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R285	1-249-393-11	CARBON	10 5% 1/4W	C611	1-162-282-31	CERAMIC	100PF 10% 50V
R301	1-249-441-11	CARBON	100K 5% 1/4W (AEP, G, IT, UK)	C612	1-162-282-31	CERAMIC	100PF 10% 50V
R302	1-249-441-11	CARBON	100K 5% 1/4W (AEP, G, IT, UK)	C613	1-162-282-31	CERAMIC	100PF 10% 50V
R303	1-249-441-11	CARBON	100K 5% 1/4W (AEP, G, IT, UK)	C614	1-162-282-31	CERAMIC	100PF 10% 50V
R304	1-249-441-11	CARBON	100K 5% 1/4W (AEP, G, IT, UK)	C615	1-162-282-31	CERAMIC	100PF 10% 50V
R305	1-249-429-11	CARBON	10K 5% 1/4W (AEP, G, IT, UK)	C616	1-162-282-31	CERAMIC	100PF 10% 50V
R306	1-249-426-11	CARBON	5. 6K 5% 1/4W (AEP, G, IT, UK)	C617	1-162-282-31	CERAMIC	100PF 10% 50V
R308	1-249-421-11	CARBON	2. 2K 5% 1/4W (AEP, G, IT, UK)	C618	1-162-282-31	CERAMIC	100PF 10% 50V
< VARIABLE RESISTOR >				C619	1-162-282-31	CERAMIC	100PF 10% 50V
RV1	1-238-601-11	RES, ADJ, CARBON 22K		C620	1-162-282-31	CERAMIC	100PF 10% 50V
RV2	1-238-600-11	RES, ADJ, CARBON 10K		C621	1-162-282-31	CERAMIC	100PF 10% 50V
< TERMINAL >				C622	1-162-282-31	CERAMIC	100PF 10% 50V
TM1	1-537-488-11	TERMINAL BOARD (ANTENNA)	(AEP, G, IT, UK, CIS)	C623	1-162-282-31	CERAMIC	100PF 10% 50V
TM1	1-537-238-21	TERMINAL BOARD (ANTENNA)	(E, EA, TH)	C624	1-162-282-31	CERAMIC	100PF 10% 50V
< VIBRATOR >				C625	1-136-173-00	FILM	0. 47uF 5% 50V
X201	1-579-175-11	VIBRATOR, CERAMIC (10MHz)		C626	1-136-173-00	FILM	0. 47uF 5% 50V
X202	1-567-098-41	VIBRATOR, CRYSTAL (32. 768KHz)		< CONNECTOR >			
X301	1-579-900-21	VIBRATOR, CRYSTAL (4. 332MHz)	(AEP, G, IT, UK)	* CN601	1-568-864-11	SOCKET, CONNECTOR 21P	
XT51	1-760-549-11	VIBRATOR, CRYSTAL (4. 5MHz)		< DIODE >			
*****				D601	8-719-046-44	DIODE SEL5221S (ENTER/NEXT)	
*	A-4378-851-A	PANEL BOARD, COMPLETE (E, EA, TH)	*****	D602	8-719-046-46	DIODE SEL5221S-TH8F (MULTI CONTROLLER)	
*	A-4378-864-A	PANEL BOARD, COMPLETE (AEP, G, IT, UK, CIS)	*****	D603	8-719-046-43	DIODE SEL5421E-TP15 (SLEEP)	
*	4-979-798-01	HOLDER (FL)		D604	8-719-046-44	DIODE SEL5221S (REC)	
< CAPACITOR >				D605	8-719-046-43	DIODE SEL5421E-TP15 (DAILY)	
C601	1-126-933-11	ELECT	100uF 20% 10V	D606	8-719-046-43	DIODE SEL5421E-TP15 (ONCE)	
C602	1-164-159-21	CERAMIC	0. 1uF 50V	< FLUORESCENT INDICATOR >			
C603	1-104-667-11	ELECT	22uF 20% 35V	FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT	
C604	1-164-159-21	CERAMIC	0. 1uF 50V	< IC >			
C605	1-162-282-31	CERAMIC	100PF 10% 50V	IC601	8-759-261-63	IC M66004M6FP	
C606	1-162-282-31	CERAMIC	100PF 10% 50V	< COIL >			
C607	1-162-282-31	CERAMIC	100PF 10% 50V	L601	1-414-189-31	INDUCTOR 100uH	
C608	1-162-282-31	CERAMIC	100PF 10% 50V	L602	1-414-189-31	INDUCTOR 100uH	
C609	1-162-294-31	CERAMIC	0. 001uF 10% 50V	< TRANSISTOR >			
C610	1-162-282-31	CERAMIC	100PF 10% 50V	Q601	8-729-119-76	TRANSISTOR 2SA1175-HFE	
				Q602	8-729-119-76	TRANSISTOR 2SA1175-HFE	
				< RESISTOR >			
				R601	1-249-413-11	CARBON 470 5% 1/4W	
				R602	1-249-415-11	CARBON 680 5% 1/4W	
				R603	1-249-417-11	CARBON 1K 5% 1/4W	
				R604	1-249-419-11	CARBON 1. 5K 5% 1/4W	
				R605	1-249-421-11	CARBON 2. 2K 5% 1/4W	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R606	1-249-425-11	CARBON	4.7K 5% 1/4W	C1704	1-124-902-00	ELECT	0.47uF 20% 50V (CIS)
R607	1-249-413-11	CARBON	470 5% 1/4W	C1705	1-101-006-00	CERAMIC	0.047uF 50V (CIS)
R608	1-249-415-11	CARBON	680 5% 1/4W	C1706	1-124-903-11	ELECT	1uF 20% 50V (CIS)
R609	1-249-417-11	CARBON	1K 5% 1/4W	C1707	1-162-288-31	CERAMIC	330PF 10% 50V (CIS)
R610	1-249-419-11	CARBON	1.5K 5% 1/4W	C1710	1-137-364-11	FILM	0.001uF 5% 50V (CIS)
R611	1-249-421-11	CARBON	2.2K 5% 1/4W	C1711	1-137-364-11	FILM	0.001uF 5% 50V (CIS)
R612	1-249-425-11	CARBON	4.7K 5% 1/4W	C1712	1-130-736-11	FILM	0.01uF 5% 50V (CIS)
R613	1-249-415-11	CARBON	680 5% 1/4W	C1713	1-130-736-11	FILM	0.01uF 5% 50V (CIS)
R614	1-247-815-91	CARBON	220 5% 1/4W	C1714	1-124-903-11	ELECT	1uF 20% 50V (CIS)
R615	1-247-815-91	CARBON	220 5% 1/4W	C1715	1-124-903-11	ELECT	1uF 20% 50V (CIS)
R616	1-249-429-11	CARBON	10K 5% 1/4W	C1716	1-124-903-11	ELECT	1uF 20% 50V (CIS)
R617	1-249-429-11	CARBON	10K 5% 1/4W	C1719	1-126-967-11	ELECT	47uF 20% 16V (CIS)
R618	1-249-413-11	CARBON	470 5% 1/4W	C1720	1-162-306-11	CERAMIC	0.01uF 30% 16V (CIS)
R620	1-247-807-31	CARBON	100 5% 1/4W	C1723	1-162-306-11	CERAMIC	0.01uF 30% 16V (CIS)
R621	1-249-417-11	CARBON	1K 5% 1/4W	C1724	1-162-306-11	CERAMIC	0.01uF 30% 16V (CIS)
R622	1-249-417-11	CARBON	1K 5% 1/4W	C1725	1-126-967-11	ELECT	47uF 20% 16V (CIS)
R623	1-249-417-11	CARBON	1K 5% 1/4W	C1726	1-124-903-11	ELECT	1uF 20% 50V (CIS)
R624	1-249-434-11	CARBON	27K 5% 1/4W	C1727	1-124-903-11	ELECT	1uF 20% 50V (CIS)
R625	1-249-429-11	CARBON	10K 5% 1/4W	C1728	1-126-966-11	ELECT	33uF 20% 16V (CIS)
< SWITCH >				< CONNECTOR >			
S601	1-554-303-21	SWITCH, TACTILE (AEP, G, IT, UK:EON)	(E, EA, TH, CIS:MEMORY)	* CN1701	1-568-832-11	SOCKET, CONNECTOR 13P (CIS)	
S602	1-554-303-21	SWITCH, TACTILE (AEP, G, IT, UK:PTY)	(E, EA, TH, CIS:STEREO/MONO)	< TRIMMER >			
S603	1-554-303-21	SWITCH, TACTILE (DISPLAY)		CT1701	1-141-260-00	CAP, TRIMMER 50PF (CIS)	
S604	1-554-303-21	SWITCH, TACTILE (SLEEP)		< DIODE >			
S605	1-554-303-21	SWITCH, TACTILE (REC)		D1701	8-719-815-85	DIODE 1S1585 (CIS)	
S606	1-554-303-21	SWITCH, TACTILE (DAILY)		D1703	8-719-815-85	DIODE 1S1585 (CIS)	
S607	1-554-303-21	SWITCH, TACTILE (TIMER SET)		D1704	8-719-815-85	DIODE 1S1585 (CIS)	
S608	1-554-303-21	SWITCH, TACTILE (ENTER/NEXT)		D1705	8-719-815-85	DIODE 1S1585 (CIS)	
S609	1-554-303-21	SWITCH, TACTILE (TUNER/BAND)		< IC >			
S610	1-554-303-21	SWITCH, TACTILE (AEP, G, IT, UK:MEMORY)	(E, EA, TH, CIS:PRESET)	IC1701	8-759-063-04	IC IR3R42 (CIS)	
S611	1-554-303-21	SWITCH, TACTILE (E, EA, TH, CIS:AUTO)	(AEP, G, IT, UK:TUNING MODE)	IC1703	8-759-140-53	IC uPD4053BC (CIS)	
S612	1-554-303-21	SWITCH, TACTILE (E, EA, TH, CIS:MANUAL)	(AEP, G, IT, UK:STEREO/MONO)	< COIL >			
S613	1-554-303-21	SWITCH, TACTILE (CHARACTER)		L1701	1-409-497-11	COIL (FILTER) (CIS)	
S614	1-554-303-21	SWITCH, TACTILE (CLOCK SET)		< TRANSISTOR >			
S615	1-473-403-11	ENCODER, ROTARY (MULTI CONTROLLER)		Q1701	8-729-029-21	TRANSISTOR DTA114ESA-TP (CIS)	
S616	1-554-303-21	SWITCH, TACTILE (ONCE)		Q1702	8-729-029-67	TRANSISTOR DTC114ESA-TP (CIS)	
*****				Q1704	8-729-029-67	TRANSISTOR DTC114ESA-TP (CIS)	
*	A-4389-480-A	POLAR BOARD, COMPLETE (CIS)	*****	< RESISTOR >			
< CAPACITOR >				R1701	1-249-432-11	CARBON	18K 5% 1/4W (CIS)
C1701	1-162-294-31	CERAMIC	0.001uF 10% 50V (CIS)	R1702	1-249-435-11	CARBON	33K 5% 1/4W (CIS)
C1702	1-130-014-00	FILM	470PF 5% 50V (CIS)	R1703	1-249-427-11	CARBON	6.8K 5% 1/4W (CIS)
C1703	1-124-902-00	ELECT	0.47uF 20% 50V (CIS)	R1704	1-247-858-11	CARBON	13K 5% 1/4W (CIS)

POLAR

Ref.No.	Part No.	Description	Remark			
R1705	1-249-417-11	CARBON	1K	5%	1/4W	(CIS)
R1706	1-249-417-11	CARBON	1K	5%	1/4W	(CIS)
R1707	1-249-441-11	CARBON	100K	5%	1/4W	(CIS)
R1708	1-249-440-11	CARBON	82K	5%	1/4W	(CIS)
R1709	1-249-439-11	CARBON	68K	5%	1/4W	(CIS)
R1710	1-249-429-11	CARBON	10K	5%	1/4W	(CIS)
R1711	1-249-429-11	CARBON	10K	5%	1/4W	(CIS)
R1714	1-249-426-11	CARBON	5.6K	5%	1/4W	(CIS)
R1715	1-249-426-11	CARBON	5.6K	5%	1/4W	(CIS)
R1716	1-249-441-11	CARBON	100K	5%	1/4W	(CIS)
R1717	1-249-441-11	CARBON	100K	5%	1/4W	(CIS)
R1718	1-249-429-11	CARBON	10K	5%	1/4W	(CIS)
R1719	1-249-429-11	CARBON	10K	5%	1/4W	(CIS)
R1721	1-249-434-11	CARBON	27K	5%	1/4W	(CIS)
R1722	1-249-441-11	CARBON	100K	5%	1/4W	(CIS)

< VARIABLE RESISTOR >

RV1701 1-238-600-11 RES, ADJ, CARBON 10K (CIS)
RV1702 1-238-599-11 RES, ADJ, CARBON 4.7K (CIS)

< TEST PIN >

* TP1701 1-560-061-00 PIN, CONNECTOR 3P (CIS)
* TP1702 1-560-061-00 PIN, CONNECTOR 3P (CIS)

MISCELLANEOUS

15 1-773-144-11 WIRE (FLAT TYPE) (21 CORE)
17 1-751-688-11 WIRE (FLAT TYPE) (13 CORE) (CIS)
FL601 1-517-368-11 INDICATOR TUBE, FLUORESCENT

ACCESSORIES & PACKING MATERIALS

* 4-980-539-01 CUSHION (UPPER)
* 4-980-540-01 CUSHION (LOWER)

HARDWARE LIST

#1 7-685-646-79 SCREW +BVTP 3X8 TYPE2 N-S
#2 7-685-647-79 SCREW +BVTP 3X10 TYPE2 N-S